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AMERICAN JOURNAL OF OPHTHALMOLOGY

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METHOD OF TUCKING THE STRAIGHT MUSCLES OF THE EYE.

H. DICKSON BRUNS, M. D.,

NEW ORLEANS, LA.

This description of the author's operation and its results was written for presentation at the meeting of the American Ophthalmological Society but not read because of the author's unavoidable absence. Among the causes of squint it is believed more importance should be attached to the actual weakness of a muscle or muscles and to faulty innervation. It seems unnecessary to assume a special center for binocular coordination. The operation is essentially that of Clark, done with an eye in the end of a movable beak which, being threaded with a suture, places what is called a guy suture as the tucker is withdrawn. Cases are reported from the writer's practice and that of his former associate, the late Dr. Robin.

Twenty-one years ago I published in the June number of the *Ophthalmic Record* a description of a method of tucking the straight muscles. This sixtieth meeting of the society, presided over by one who has contributed so much to our knowledge of the function of these muscles, seems to me an appropriate time to return to the subject. Besides, were I never to mention the matter again, the conclusion would be justified that my one small contribution to ophthalmic surgery had turned out a failure and had been abandoned by its parent.

Now this is not at all the case. My late friend and associate, Dr. E. A. Robin, and I have done the operation a great many times, and I continue to do it, with satisfactory results.* In 1916 Dr. Robin gave a description of the operation and reported the results obtained in several typical cases in a paper read before the Texas State Medical Society, published in the *Texas State Journal of Medicine* for November of that year. I resubmit this report as evidence of the efficacy of this method of tucking, adding the histories of one or two later cases that seem noteworthy.

CAUSES OF SQUINT.

I do not propose to discuss here the theories of squint, but I should like to say a few words as to what I do, and do not, believe about the cause of the anomaly. In a review of Hansell and Reber's "Muscular Anomalies" in the *New Orleans Medical and Surgical Journal* at the time the first edition of the book appeared, I wrote that observation of the lower animals, to say nothing of embryology, made it certain that the faculty of binocular single vision was a late acquirement of the human race. It is certainly, therefore, more easily deranged than more primitive faculties. Even now the still divergent axes of the orbits, the position of the eyeballs within them and the development of six out of the eight straight muscles in such a way as to give an adductive sense to their action, indicate that convergence still retains some difficulties. When we consider all the obstacles which beset convergence for the purpose of binocular single vision, the only wonder is that so small a portion of civilized man squints. I do not believe that savages often have this defect. I do not remember seeing it commented on in books of travel among them, or seeing pictures of them showing it. True squint is a curiosity among our blacks, and is rare even among those of mixed blood.

Every one who has watched an infant beginning the purposive use of its eyes must have appreciated its difficulties. What a multitude of nerve paths must become those of least resistance, what a number of peripheral and central and intercentral connections must be adjusted before the function striven for grows absolutely automatic.

*It is noticeable that we do not make nearly so many operations for squint either in private or hospital practice. Our people have learned that the greater number of squints can be corrected without resort to operation if taken early and now they bring their children, almost invariably with the question, "can it be cured with glasses?"

Learning to walk upright, also a late racial acquirement, seems to me closely analogous to the use of the two eyes for single vision. It too is a highly complicated coordination, yet no one would think it necessary to posit a walking center. The infant beginning to use its eyes stumbles at first into greater or less degrees of double vision, a condition that becomes, thru evolutionary processes, as disagreeable as a pain, besides militating against the efficiency of the individual. Every effort, therefore, is made to get and to keep the eyes so directed that the image in each will fall on that part of the retina, where the two will be regarded by the brain as representing one and the same object. As in the case of walking the purpose is usually accomplished in spite of difficulties, because each failure is accompanied by unpleasant consequences.

If after due time the child fails to walk, we begin an investigation into the state of its muscular and nervous systems; we do not imagine that a walking center has failed to develop. It seems to me that we should do the same in cases of failure to attain to binocular single vision.

In the well known cases in which there is no squint, in spite of a high degree of amblyopia in one eye and perfect vision in the other, it cannot be the effort of a fusion center that keeps the eyes properly directed. I have notes of many such cases in both hypermetropes and myopes. It is elementary that myopia will predispose to exotropia and hypermetropia to esotropia; the hypermetrope, too, is always exercising and, presumably, strengthening his internal recti. Yet we have all met with exceptional cases of esotropia in myopes and exotropia in hypermetropes.

When an eye which has shared in binocular single vision is blinded, it usually turns in or out according to the state of refraction. But I have seen a blinded hypermetropic eye acquire an exotropia, tho I must confess that I have no recollection of having seen a myopic eye under the same circumstances turn in. These facts seem to be also strongly against the theory of a fusion center.

That a congenital amblyopia may provoke a squint seems likely, and I see no way in any given case of disproving it; but that the amblyopia can be, and often is caused by the squint is made certain by the result in many cases. In case 12 in Robin's report a vision of 3/200 in the squinting eye became normal in 12 months after correction of the squint. It is impossible in such cases not to believe that the amblyopia was caused thru disuse; but must we also believe that a dormant fusion center was aroused to action?

It is for these reasons, that rejecting the fusion center theory, I find myself with those who believe the true cause of squint lies usually in the excess, or more commonly in lack, of strength in one, some times two, of the extrinsic muscles. The patient labors of Dr. Lucien Howe have shown how diverse are these muscles in the eyes of different individuals. Considering the complex nature of the function, the many obstacles to be overcome, it seems not at all strange that a small difference in the power of one of the muscles should produce an imbalance, soon becoming a fixed position in the effort for clear vision.

Finally, the use of Stevens' tropometer supports the "muscular theory" of squint. Altho by many measurements Stevens seems to have fixed the extreme amount of turning that can be exerted by each straight muscle as measured by his instrument, it is not these absolute figures that are important, but the relative strength of any muscle shown by comparing the eight readings obtained in the two eyes. These measurements usually indicate a relative weakness of one or two muscles, and justify tucking or advancement as more physiologic than tenotomy. In many cases, usually depending on the duration of the squint, both advancement and tenotomy will have to be done to secure a perfect result.

As to the cases due to some fault of innervation, we find them in the phorias quite frequently. We are guided by taking the history and all the circumstances and symptoms together. These are the cases in my experience that are helped by prism and

similar exercises. Not seldom all the annoying symptoms may be thus relieved without any change having been brought about in the original phoria; the patient learns to command his eyes. In squint, variations in our findings at repeated examinations; and, in alternating cases, unusual positions of the nonfixing eye, seem to indicate abnormal innervation, but if the true nature of the muscular anomaly is detected it presents no obstacle to correction. Muscular weakness or abnormal innervation of both eyes would seem to be due to derangement of innervation, but it may be successfully dealt with by judicious tucking.

It is unnecessary to repeat here the methods of examination of the extrinsic muscles of the eye and the indications to be drawn from them: They can be found in the writings of Dr. Duane, to whom we owe much of our knowledge of the subject. My experience entirely agrees with his as to the risk of making tenotomies of the superior and inferior recti. Shortening is far safer. The interni, too, are such important muscles of civilized life that it seems desirable to strengthen, rather than weaken them by an operation.

In unilateral, or fixed squints of one eye, with low visual acuity, tenotomy of the opposing muscle must usually be combined with tucking. In such cases it is best by combining these procedures to bring the squinting eye into the primary position at one sitting. The unsightly proptosis which follows tenotomy is eliminated by tucking of the opposing muscle. Tucking appeals to me as safer than advancement, for in case of failure the condition is no worse than before the operation. Can the same be said of advancement? As far as I am concerned it can be as well graded as advancement by regulating the size of the tuck according to all the indications given by our examinations; for I am free to confess that I have never been able to secure just so many degrees of correction by just so many millimeters of elevation of the tuck.

I was led to compose this operation by combining the good points of several others, thru the invention of his tucking hook by our colleague, Dr. C. F. Clark, of Columbus, Ohio. With his permission I slightly modified the instrument,* the principal change being a hole made in the end of the movable beak, for carrying the guy suture thru the bight of the tuck. This guy suture, the original feature of the operation, not only draws forward and holds the tuck in place for 5 to 7 days, but it also holds the eye for the same length of time in an exaggerated degree of the new and correct position, a decided advantage. As soon as chemosis and hyperemia subside, and for a long time afterwards, the tuck flattened down and drawn towards the cornea, can be seen thru the conjunctiva. We are certain that we have accomplished what we intended.

I do not think there is any danger of slackening our pull upon the tuck while closing the conjunctival wound with the guy suture, if we are careful never to relax our pull on the suture until our knot is tied. It should be drawn as tight as it can be without endangering the cornea, which should always be protected by the forward flap of the conjunctival wound. By lifting this flap we can at any time see if the tuck is in proper position beneath it. Experience has taught me that we should not seek to raise the tuck too close to the insertion of the tendon. By raising it about 2 mm. behind the actual insertion, we form a better and more easily transfixed tuck.

Dr. Robin was in the habit of using OO chromicised catgut for tying off the tuck. On one occasion at least the gut gave way too soon. I always use a fine but strong white silk, well boiled. I have never known the small knot of this substance to produce the slightest irritation. One of my confreres, however, tells me that he once had to remove the knot from beneath the conjunctiva. Finally, I must say that the very decided reaction, varying somewhat in different persons, is the greatest drawback to the operation.

*I should like to record that I did all I could to prevent this from being advertised as Bruns' modification of Clark's hook, a practice I had always deprecated. Unfortunately the custom of the instrument makers proved too strong for me. I could only offer Dr. Clark *l'amende*.

Cold applications, aspirin, or other analgesics, have to be used the first night.

THE OPERATION.

The patient's face and eyelids having been thoroly cleansed, the conjunctival sac is repeatedly filled with 10% argyrol solution and repeatedly washed out with physiologic salt solution.

In all but small children the operation is done under local anesthesia. With a rather long needle 2 cc. of 2% novocain solution containing a drop or two of 1 to 1000 adrenalin solution is injected behind the ball, in the neighborhood of the ciliary ganglion; and the same amount along the course of the muscle to be operated upon. Pain is rarely abolished, but is rendered quite tolerable.

A long vertical incision about 2 mm. to the corneal side of the insertion should expose the field thoroly. A small strabismus hook catches up all the fibers of the tendon as in a free tenotomy. As soon as the capsule on the point of the hook has been opened, the extended movable middle beak of the Clark's hook is inserted close along side of it and with a rapid to and fro movement strips the tendon clean of surrounding tissue. By turning the nut on the shaft, the middle beak, carrying a fold of tendon with it, is made to rise 3 or 4 mm. above the two stationary ones. This forms the tuck. A small full curved needle carrying, doubled for some four or five inches, a fine but strong white silk is passed thru the middle of the tuck between the sclera and the hook. The needle being cut off, one strand of the silk is tied, under the hook, on the upper border of the tendon and the other on the lower border. Care must be taken to include nothing besides the tendon fibers. These knots remain buried under the conjunctiva. Before drawing the hook out of the tuck a small curved needle carrying a No. 9 black silk suture is passed thru the hole at the end of the middle beak. This beak is now pushed down a little, by a turn or two of the nut, so as to diminish its pull upon the tuck, out of which it is carefully and gently withdrawn. It carries with it the double black silk suture thru the bight of the tuck. That end of the suture which does not carry a needle is drawn out and, the hook being removed, is threaded into a similar needle. The suture is now armed with a needle at each end: The upper one is carried under the conjunctiva and made to emerge 2 to 4 mm. above the cornea in the vertical meridian. The other needle is carried under the conjunctiva in the same way and is made to emerge in the vertical meridian below the cornea, at exactly the same distance as the first. A simultaneous pull upon the two ends of the suture pulls the tuck down parallel to the sclera and draws it under the anterior flap of conjunctiva towards the cornea. The two needles are carried back to the posterior conjunctival flap and penetrate it from the mucous (external) surface and come out again on the mucous surface about 3 mm. apart. They are now tied as tightly as possible, care being taken to protect the cornea with the anterior conjunctival flap. In this way the wound is closed and the tuck held in its flattened drawn-forward position and the eye turned forcibly in the desired direction. This is the so called guy suture. When it falls slack, in from 5 to 7 days it should be cut at any point and removed.

CASES OF DR. ROBIN.

Case 1.—H. D., white man, aged 33, came March 23rd, 1915, with alternating esotropia. R. V.=20/15 with +3.50 ⌒+1.00 cylinder, ax. 90°. L. V.= 20/15 with +3.50⌒+1.50 cylinder, ax. 90°. Fuses images with 41° prism. Tropometer: R. in 50, out 40; L. in 55, out 45. Tucked right external rectus under local anesthesia; no pain; removed guy suture 5 days later; patient sent home; wore glasses constantly.

June 10th, tucked left external rectus; no pain; removed guy suture 7 days later; sent patient home.

June 19th feeling well; eyes straight; Maddox rod shows 2° esophoria; stereoscopic vision good. Writes December 10th, 1915, result of operation perfect; has used eyes past four months classing cotton, and eyes are perfectly straight and comfortable.

Case 2.—P. H., negro woman, aged

22, came February 24, 1909, with alternating exotropia. Fuses with 37° prism. R. V. and L. V.=20/15, emmetropic.

Tropometer: R. in 40, out 60, up 40, down 55. L. in 50, out 60, up 40, down 55.

February 27th, tuck of right internal rectus. Removed guy suture.

March 8th, result insufficient.

March 10th, tuck of left internal rectus.

March 19th, removed guy suture; result very good.

March 24th, practices with stereoscope daily.

May 3rd, eyes are straight; Maddox rod shows orthophoria all distances; good stereoscopic vision.

Case 3.—G. B. W., white man, age 28, came October 16th, 1909; severe pain in head and eyes, coming on after close work in afternoons. Maddox rod shows esophoria 15° at 20 feet.

R. V.=20/15 with +1.50⌒+0.75 ax. 90°.

L. V.=20/15 with +1.50⌒+1.00 ax. 90°.

Ordered full correction for constant wear. Returned September 8th, 1915, complaining of constant pain in head. Has been wearing for past two years a 5° prism, base out, incorporated in each glass, ordered by another oculist. Maddox rod shows esophoria, 20° at 20 feet with above glasses.

Tropometer: R. in 50, out 35, up 25, down 55. L. in 50, out 40, up 25, down 55.

September 9th, 1915, tuck of right external rectus; no pain.

September 16th, removed guy suture. Maddox rod shows esophoria 4° at 20 feet; wearing glasses constantly since day after operation.

September 23rd, Maddox rod shows esophoria 3° at 20 feet; went home feeling very well.

February 19th, 1916; has been entirely relieved by operation and glasses.

Tropometer: R. in 45, out 40, up 25, down 50. L. in 45, out 45, up 30, down 45.

Maddox rod; no hyperphoria; esophoria 4° at 20 feet.

Case 4.—J. S., white man, aged 19, came October 16th, 1908, with monocular esotropia; has squinted with left eye for three years, he says.

R. V.=20/15. L. V.=3/200.

Static Refraction: R.+4.50⌒+0.50 ax. 165°=20/20. L.+5.00⌒+1.50 ax. 150°=3/200.

Tropometer: R. in 45, out 45, up 40, down 40. L. vision too poor for reliable findings.

November 14th, 1908, no change in vision of squinting eye; case looks like one with congenital amblyopia of left eye. I made a tuck of left external rectus and full tenotomy of left internal rectus at same sitting. Immediate result was slight esotropia which disappeared when glasses were put on; told to wear glasses constantly. There was rapid improvement of vision in the amblyopic eye:

November 16th, L. V. with glass = 10/200; eyes were straight.

December 5th, L. V. with glass = 20/200.

December 19th, L. V. with glass = 20/70.

January 23rd, L. V. with glass 20/30.

November 13th, R. V. with glass = 20/20. L. V. with glass = 20/20. Has binocular vision; Maddox rod shows orthophoria at all distances; is perfectly comfortable. The results in this case show conclusively to me that there is no *a priori* method known, even Valk's, that can be regarded as infallible in differentiating a congenital from an amblyopia *ex anopsia*. It is evident that the improvement in vision in the patient's left eye, from 3/200 to 20/20 (this confirmed by several observers) established incontestably the nature of the amblyopia.

Case 5.—E. S. F., white man, age 43, came April 19th, 1913, with left hypoesotropia; troubled with his eyes about 5 years; of late in order to avoid distressing diplopia, when looking down, he rotates head, chin going to the left and vertex to the right. This would suggest trouble with oblique. Examination with red glass shows no inclination of images. False image belongs to left eye. R. V. and L. V. with +1.75=20/15. Maddox rod shows esophoria, 8° at 20 feet. L. hypophoria, 5° at 20 feet.

Tropometer: R. in 60, out 55, up 40, down 55. L. in 60, out 50, up 30,

down 55. Shows weakness of left superior and external recti.

April 28th, 1913, tuck of left superior rectus; no pain; bandaged 24 hours.

April 29th, has vertical and lateral diplopia, without red glass. Fuses with 8° base out and 5° base down before left eye; showing an overcorrection as an immediate result.

May 1st, doing well; fuses with 2° base out, normal vertical balance.

May 3rd, removed guy suture; Maddox rod shows esophoria 3½°; L. hyperphoria = 1.

May 4th, Maddox rod shows esophoria 3½°; no hyperphoria.

May 7th, Maddox rod shows esophoria 3°; no hyperphoria. Went home wearing R. and L.+1.75 spheres for distance and R. and L.+1.0 added to his distance glasses in toric kryptoks.

May 1st, 1924, he wrote that eyes were comfortable and that a local oculist found esophoria 3°, but no hyperphoria.

CASES OF DR. BRUNS.

Case 1.—Miss R. C., aged 11, came to us on June 5th, 1920. R. E. extreme esotropia, at least 25°. Motion outward restricted. Can be made to alternate. At about 4 inches, L. fixes, R. diverges. R.+4.50 s.=20/50. L. E.+3.50 s.=20/20. July 12, 1920, made large tuck of right external rectus under local anesthesia. Eyes look straight. July 20, 1920, removed guy suture.

July 21, 1920, with glasses on, eyes look straight, goes home; to return in 3 or 4 weeks.

August 22, 1920. Wound entirely healed. Eyes look almost straight.

Cannot produce double vision by any means. Sept. 22 and 23, 1920. Maddox rod at 20′ esotropia seems to be about 7°, but the double vision very transitory. Static refraction, under atropin: R.+4.50 s.=20/30. L.+4.50 s.=20/15. R. and L.+4 s. ordered for constant use. Eyes look almost straight.

April 15, 1922, with glasses, V. R. =20/30, a few letters. V. L.=20/20, well. Eyes seem parallel with tendency, once in a great while, for R. to deviate inwards. Maddox rod at 20 ft. esophoria 12°; right hyperphoria 2°. March 22, 1924. R. V., glass, =20/40. L. V., glass, =20/15. M. rod at 20 ft., esophoria=8°. No vertical imbalance. No astigmatism (Javal). Eyes are comfortable; no headache. The case shows the possibility of the correction of a bad, virtually fixed squint, by tucking tendon of one straight muscle, of one eye, in a young person.

Case 2. Mr. E. C. came under my care at the age of 18, in January 1924. He had up to this time been a patient of Dr. E. A. Robin, who had seen him at four years of age with a periodic esotropia. Under atropin he was again found to have high hypermetropia; R. and L. V.+3 s. The squint, vision and headache following study, varied.

In December, 1918, he has complained of dizziness on turning suddenly, and that the letters jumped about when he read. Reexamination showed: R. and L. V. +3 s.=20/20, Maddox rod at 20 ft., left hyperphoria=6°; esophoria 3°. R.+3 s.⌒pr. 2° base up, L.+3 s.⌒pr. 2° base down were prescribed.

These glasses gave comfort for a year, when in December 1919, the L. hyperphoria was found to be 8° and the prisms were increased to 3° on each eye.

March 16, 1920, headache after reading and the L. hyperphoria is found to be 12°. An increase of the prisms to 4° each was tried for a while, but on April 11, 1920, Dr. Robin tucked the inferior rectus of L. E. April 14, 1920, there seemed to be no vertical imbalance. April 17, 1920, guy suture was removed, and L. hyperphoria found to be 3°. In spite of this he got on fairly comfortably wearing his +3 sph. constantly; but in June, 1920, it was 8°. In this year Dr. Robin died.

In January, 1923, L. hyperphoria= 10°. His refraction was carefully measured by my associate Dr. W. R. Buffington and found to be: R.+2.50 s. ⌒+1. cyl. ax. 100°=20/20. L.+2.50 s. ⌒1. cyl. ax. 85°=20/15. And these were combined with prisms 3° base up and base down.

By October, 1923, left hyperphoria, with glasses, were 14°. There was also slight, but distinct, left hyperphoria. On February 5, 1924, I did a large tuck of the right superior rectus tendon. Immediately after the operation there seemed to be still 4° of left hyperphoria; but the patient was suffering, the eye disturbed, and we could not be

accurate. As the amount of hyperphoria appeared to be small I did not tenotomize the inferior rectus, which I would have liked to do.

On February 13, 1924, I could be sure with the Maddox rod at 20 ft. the left hyperphoria was between 3° and 4°. By February 18, 1924, the left hyperphoria had become 8° and on Feb. 20, I made a tenotomy of left superior rectus. The tendon was divided thru a small conjunctival incision at right angles to its course. The tendon seemed thick, inelastic, with most of its wing fibers to the temporal side. February 21, 1924; a suture which I attached to the tendon during the operation, to control it, had been at once removed, as the affect did not appear great. I regretted it; for the Maddox rod at 20 ft. showed 3° of left hypophoria and there was perceptible estropia estimated at 18°. There was double vision and he wore a patch over R. E. The homonymous double vision gradually disappeared, and his prism of 4° base out, R., was gradually weakened until by March 3, the esophoria was only the 2°, normal for his age. But a vertical and slanting diplopia for lines of print, which came on soon upon reading, persisted. The vertical meridian of the cornea was evidently inclined.

April 21, 1924, L. hypophoria was about 6°. R. E.+2.50⌒1 cyl. ax. 100° ⌒pr. 2 base down=20/30. L. E.+2.50 ⌒=1 cyl. ax. 85°⌒pr. 2° base up= 20/15, some letters. A full correction was prescribed, and by May 5, all doubling had disappeared. With correction and Maddox rod at 20′ esophoria was 4°, but without his correction the left hypophoria seemed to reach 11°, but was hard to estimate exactly.

June 9, 1924, R. V.=20/xx. L. V.= 20/xv. Without glasses esophoria=8° (M. rod at 20′). Without glasses L. hypophoria=4°-5°. With glasses hypophoria=1°, and he was comfortable.

This case shows all too well how completely unforeseen and distressing may be the effect of a tenotomy of a superior, or inferior, straight muscle. It is hard to escape the conclusion that abnormal innervation of the extrinsic muscles played its part.

TUMORS OF THE LACRIMAL GLAND.

ABRAM B. BRUNER, M. D.,

CLEVELAND, OHIO.

This is the report of two cases in which the tumors developed rapidly. Both were excised and the histologic appearances found are described. Read before the Ophthalmological and Oto-Laryngological Section of the Cleveland Academy of Medicine.

The infrequency of new growth of the lacrimal gland makes each individual case of interest to the observer. In the AMERICAN JOURNAL OF OPHTHALMOLOGY for June, 1922, Lane gives a review of the literature on this subject and draws certain conclusions. For the sake of emphasis I should like to repeat two points that she summarizes in her article:

1. Lacrimal gland tumors are malignant, as is shown by a death rate of 12.63 per cent and also a fairly high rate of recurrence and metastasis.

2. That the lacrimal gland is partly derived from the epiblast and partly from the mesoblast, and that tumors of the gland are mostly epithelial in origin and are best classed as mixed tumors.

Three types of new growth may be classified:

a. Cystic dilatations of one or more of the ducts of the gland, usually denoted as cysts or dacryops.

b. Enlargements of the lacrimal gland due to syphilis, tuberculosis, and the disease known as Mikulicz' syndrome.

c. Neoplasms. Nearly all known pathologic types have been described, but the large majority have been described as endothelioma, sarcoma, carcinoma and mixed tumors.

CASE 1. C. K., a man aged twenty-two, was first seen March 3rd, 1922. He stated that he had noticed a swelling of the left upper lid for about three weeks, the swelling having slowly and steadily increased in size. He had

never had any previous trouble with the eyes.

General physical examination showed a moderately well developed and well nourished young man, skin, lungs, heart, abdomen and extremities normal. Blood Wassermann was negative. Examination of the local condition showed a prominence of the left upper lid over the location of the lacrimal gland. This swelling was soft and very slightly tender and was freely movable on the deeper structures of the orbit. It apparently extended posteriorly thru the lid as it could be palpated behind thru the upper cul-de-sac. The growth as a whole had a cystic feel, but no definite area of fluctuation could be made out. Three weeks after first being seen the growth had increased considerably in size and ptosis had become marked. The vision in each eye was 6/10.

Operation was performed on March 23rd, the approach being made thru the upper lid directly over the tumor. This revealed a soft, fat like growth involving the whole lacrimal gland, extending backward thru the orbital septum. The neoplasm had a lobulated appearance and was not definitely encapsulated. Recovery was uneventful, the wound healing, however, with some adhesion of the scar to the deeper tissues; and a slight amount of ptosis, but not enough to cover any of the pupillary area.

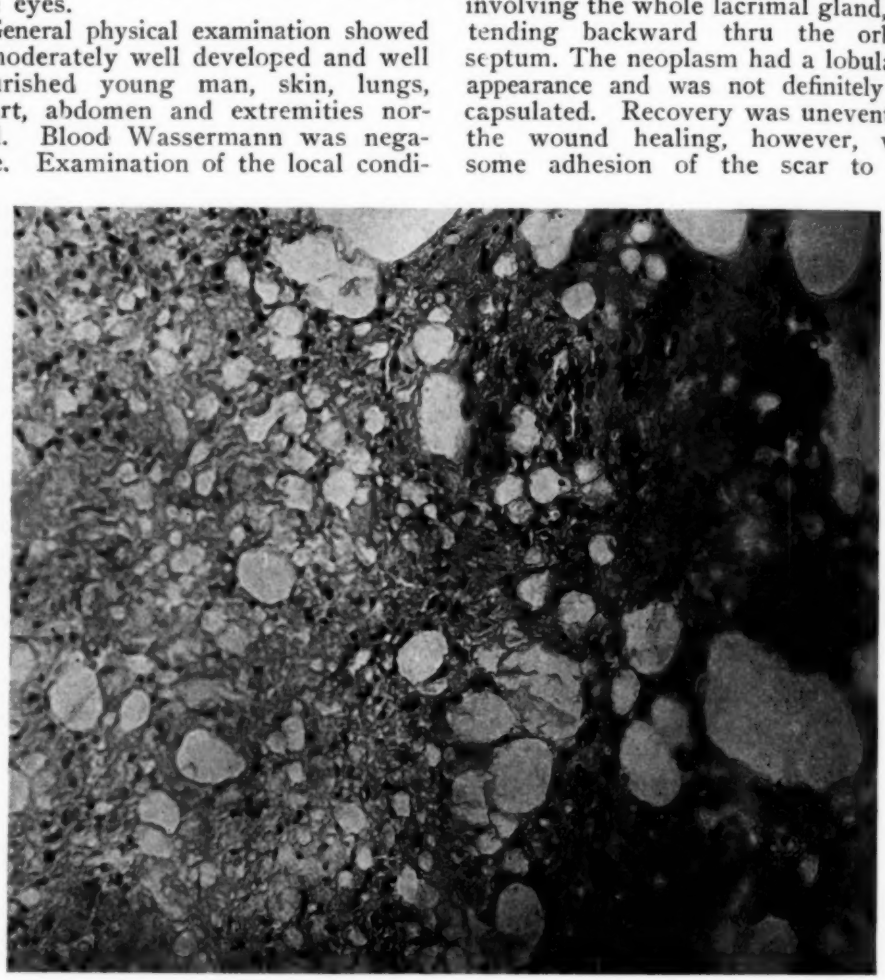

Fig. 1.—Tumor of lacrimal gland (fibromyxolipoma).

Pathologic Report. Section shows young fat and areolar connective tissue cells, with many engorged blood vessels. In places there are small areas of hemorrhage. In a few places around some of the blood vessels there is mononuclear round cell infiltration. The fat cells are especially numerous thruout and of a myxomatous type. In no place does it show any definite capsule. The tissue is a new growth made up chiefly of new formed connective with large numbers of embryonal fat cells. Can be best classified as a fibromyxolipoma.

CASE 2. A. B., a youth aged 17, was first seen June 14th, 1922. He stated, that slightly over a year before his mother had noticed that his left eye seemed to be more prominent than the right. Since that time this prominence has become gradually more pronounced, especially during the past four months. As far as known the condition has been steadily progressive with no periods of remission. There has never been any pain, or inflammatory symptoms; but diplopia appeared about one month ago, lasting, however, only a few minutes. The family history is of no importance and the past history negative except for an attack of typhus several years ago. Venereal infection was denied.

General physical examination showed a well developed and well nourished youth. Skin, lungs, heart, abdomen, extremities and other special senses were all normal. Blood Wassermann was negative and X-ray of the orbit showed no shadow.

Examination of the local condition showed a well marked prominence of the left eye, the globe being displaced forward, downward and a little inward. There was a moderate ptosis of the left upper lid, with a decided limitation of upward movement. The conjunctiva, sclera, cornea, pupil and tension of the eye were normal. There was slight limitation of abduction in this eye and almost complete limitation of upward movement. Vision in the right eye was 5/21, in the left eye 5/7.5.

Fig. 2.—Tumor of lacrimal gland (teratoma).

Ophthalmoscopic examination showed a moderate amount of myopia in each eye. All the media were clear, the optic discs of normal color with normal vessels and distinct margins. The fundi thruout were slightly hyperemic and finely granular, with no pathologic findings.

In the upper and inner quadrant of the left orbit there is felt, behind the lid, a firm nodular mass about the size of a walnut. This was very slightly movable and was apparently attached to both the deeper structures of the lid and the tissues in the orbit. There was no local tenderness and no area of fluctuation. Exophthalmometer showed the right eye to measure 14 mm. and the left eye 21 mm.

Operation was performed on Au-

gust 15th. The external canthus was slit and the upper lid completely everted. The tumor was easily delivered thru an incision in the upper cul-de-sac. It was found to be completely encapsulated and not very densely adherent to the surrounding tissues. Recovery was uneventful and in the space of four weeks the eye had resumed its normal position and all associated muscular movements were normal. Correction of his error of refraction gave vision of 5/5 in each eye.

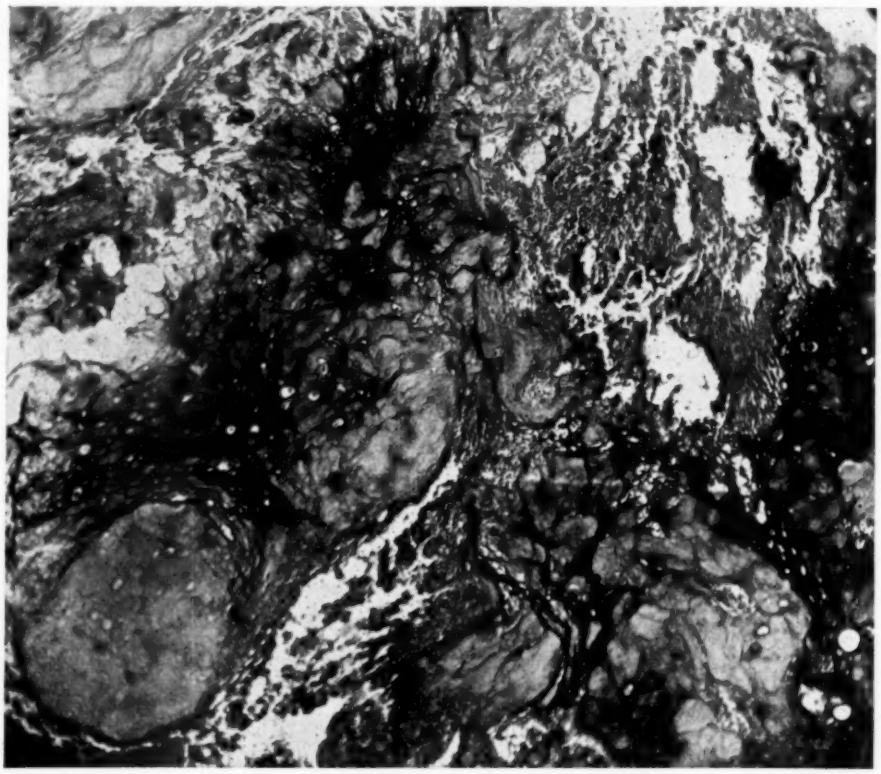

Fig. 3.—Section of tumor of lacrimal gland (teratoma).

Pathologic Report: The gross specimen was a fairly firm and rounded mass about the size of a walnut. Microscopic sections showed a tumor of mixed type with some interesting characteristics. There are many masses of spindle cells with oval nuclei containing fairly abundant chromatin, and scattered thruout these cell masses are a few large polygonal and globular cells. In addition, there are striking masses of large cells with vesicular nuclei and pink cytoplasm, embedded in an abundant matrix which in places is blue stained, in places lavender and in still other places pink. These masses closely resemble plates of cartilage. In a few places the cells are smaller and the masses suggest bony trabeculae. In the tumor are also gland like structures lined by flat or cuboidal or columnar epithelium, the latter in places appearing ciliated. In the lumen of these gland like structures there is an amorphous pink or blue staining material. There are also some areas closely resembling epithelial pearls with layers of stratified flat to polygonal epithelium, and pink staining amorphous centers. About the tumor there is a hyalinized fibrous capsule 150 to 200 micra in thickness, the capsule being in no place invaded by tumor tissue. Diagnosis: Teratoma.

I am indebted to Dr. B. S. Kline, formerly resident pathologist at the Lakeside Hospital, for his aid in the pathologic diagnosis of these tumors.

EPITHELIAL DYSTROPHY OF CORNEA AN OCULAR MANIFESTATION IN DIABETES.

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BALTIMORE, MD.

Fuchs' description of this corneal lesion in 1910 has been followed by several papers that are here briefly reviewed. The pathologic histology and clinical characters are fairly understood. But the etiology remains obscure. Two cases seen by the author have occurred in patients suffering from diabetes. The general clinical history of other reported cases would not oppose such an etiology. Two cases are here reported in which diabetes was found and treated with benefit to the corneal lesions. (Read before the American Ophthalmological Society, June, 1924.)

In a rather careful survey of the literature upon the subject of corneal dystrophies, the writer has been unable to find a single case with diabetes as either the exciting or indirect cause, barring the instance reported by himself in the Johns Hopkins Hospital Bulletin of May, 1914. In fact, those who have described the condition, Fuchs, Paul Knapp, Reese, Guist, Troncoso and Uhthoff, have consistently failed to detect any definite etiologic factor whatever. They agree, however, in almost all of the following points: that it occurs most frequently in middle life, usually affects the female sex, with a predisposition for the right eye, is frequently associated with slight and transitory rises in the intraocular tension, and, finally, that the course of the degeneration, as well as the visual diminution, is gradually progressive, despite any known form of treatment.

The condition, as such, was unknown until 1910, when Fuchs' interesting monograph appeared, describing the 13 cases he had seen since 1900. As he says, many cases, prior to that time, had undoubtedly been diagnosed and treated as glaucoma, owing to the elevation of intraocular tension, and the almost characteristic appearance of the corneal epithelium. Since his splendid description of the course and character of the condition, however, several observers have diagnosed similar cases, and added their reports to the literature upon the subject, a total of 19 cases.

The slow and progressive course of this condition distinguishes it clinically from any of the inflammations, for the latter are marked by a period of progression, followed later by one of regression, while anatomically the dystrophies are characterized by degenerative changes as opposed to the cellular invasion of inflammatory lesions.

The majority of dystrophies are the expression either of a local disturbance of nutrition, or, as Reese has pointed out, some general malnutrition. For example, the deposits of mucin in myxedematous subjects after thyroidectomy, the grayish-green discoloration of the cornea occurring in disseminated sclerosis, and, according to Weeks, disease of the Gasserian ganglion and traumatism. But, to dystrophy of the corneal epithelium no definite etiologic factor has been ascribed. Hence the writer feels some hesitation in advancing his opinion that diabetes was the direct or remote cause in the cases to be reported, even tho the diet, insulin and presence or absence of sugar did so markedly influence the ocular condition.

If the metabolic disease in question did bear some definite relation to the trophic disturbances which took place in the cornea, some interesting conjectures as to the modus operandi might be made. Was the process caused by a direct toxic action on the trophic apparatus; for instance, by a temporary flooding of the blood or lymph with diacetic acid or beta-oxybutyric acid? Or was the degeneration purely a nutritive one, caused by a perversion of the pabulum normally carried to the corneal epithelium, and due to a degeneration in the walls of the small blood vessels? Again, might the bullous condition of the epithelium be analogous to the desquamative dermatitis so constantly observed in diabetes?

Epithelial dystrophy is easily differentiated from family nodular keratitis, from affections due to noxious vapors, from keratitis vasculosa with herpes,

from postoperative sclerosis, and from hyalin or fatty degeneration of the cornea.

The pathology of dystrophia epithelialis corneae is rather vague: Paul Knapp contends that it is due to a chronic edema of the epithelium. Fuchs has had the opportunity of making a microscopic examination of one case. There was grayish opacity and roughening of the surface of the cornea from small vacuoles in the epithelial cells, and *newly formed tissue between Bowman's membrane and the epithelium.* This tissue was homogeneous, and without signs of hyalin or mucoid degeneration. The epithelium covering it was thinner than normal, but the cells were not flattened or hornified. He thinks that in the earlier stages the epithelium is probably thickened and vacuolated.

Uhthoff, writing of degenerative changes of the cornea in 1916, concludes that, in dystrophia epithelialis corneae, Bowman's membrane is affected very little, if at all, and admonishes against confounding this disease with the socalled dystrophia calcarea of Axenfeld. Four years later, he had the opportunity of studying a case most minutely, his results being abstracted as follows:

The patient had had the disease for over 10 years, affecting first the right eye, later the left, and presenting the clinical picture accurately described by Fuchs a decade before. In the right eye, the dystrophy finally resulted in an intense grayish-white opacity of the entire cornea, barring a narrow strip at the margin with some vascularization. The surface was smooth, but the diseased area was slightly swollen. The superficial layers of a portion of the diseased area of the cornea were removed for examination and the epithelial layer was found thickened, the superficial portion swollen in places. The upper epithelial cells were in places drawn out longitudinally, so that occasionally they seemed to be parallel fibers. The lowest layer of the basal cells alone could be called practically normal, but even here some of them showed pathologic changes. Bowman's membrane was entirely absent. The superficial layers of the cornea were, in places, completely degenerated and transformed into a matted tissue of fine fibers with a sparse amount of degenerated cornea. In other places the corneal tissue was broken down into broad, wavy lines, and edematous. The changes affected the superficial layers of the cornea particularly, while the deeper ones seemed to be still transparent.

Case 1. The patient, a negro, 53 years of age, married, and a whitewasher by occupation, came to the clinic on June 9, 1913, complaining that, for several weeks prior to that date, there had been gradual diminution in the vision of his right eye, unaccompanied by pain. There seemed to be a "shadow" before his eye, and for the past week it had been slightly sore. Previous medical history negative; no malaria, no trauma, no syphilis. Gross inspection revealed a well-nourished, vigorous man with a rather dry, coarse skin, and a coated tongue, but, on the whole, presenting no abnormal appearance.

Minute inspection of the cornea of the right eye, with the binocular loupe, showed a small, central, superficial, herpetic, epithelial loss, which was clear, uninfiltrated, and stained faintly with fluorescein. Midway between the center of the cornea and the limbus a very faint, whitish crescent was seen, evidently lying between the epithelium and Bowman's membrane, or in the anterior lamellae of the substantia propria. The corneal epithelium, itself, surrounding this area and extending to within about 3 mm. of the limbus, was diffusely clouded and hazy, as tho edematous; minute, distinct vesicles being present. There was only slight congestion of the ciliary vessels and the iris was normal in appearance, altho the pupillary reactions were sluggish. The tension of the globe was not elevated, and the anterior chamber was not shallow. No view of the fundus could be obtained with the ophthalmoscope, and vision was limited to counting fingers at 40 cm.

The observer's first thought was of a rare, ring shaped keratitis, which was somewhat borne out by the fact that the

crescent later completely encircled the center of the cornea. However, the inflammatory evidences, excluding the vague, pericorneal congestion, were so slight, and so out of proportion to the corneal disturbances, that one felt inclined to abandon the diagnosis of an actual keratitis and look upon the condition as a trophic or nutritional affection, an epithelial dystrophy, due, perhaps, to some general dyscrasia, a view which was partially substantiated by finding diminished sensibility of that cornea, as compared with its fellow, both being hyponormal in that respect.

The patient was advised to enter the hospital, and the following examinations were made by Dr. Guerinot: Neurologic and physical—negative.

Blood: Pale, slowly coagulable, little fibrin, Hb. 68%, R. B. C. 3,650,000; W. B. C. 6,200. Differential count: Small mononuclears 24%, large mononuclears 4%, polymorphonuclears 70%, eosinophiles 2%.

Blood pressure, 148 mm. Tuberculin test (von Pirquet), negative. Wassermann blood test, negative.

The patient was placed under an appropriate local and general regimen with no appreciable change in the corneal condition until June 24, when urinalysis showed a specific gravity of 1,030, and 0.5% sugar. A strict "sugar free" diet was at once ordered; in six days there was complete restoration of the corneal epithelium, and on June 30th, the patient was discharged and told to report at regular intervals for treatment in the dispensary.

He failed to do so, however, and did not come back until August 18th, when he returned to the clinic with the haziness of the cornea much deeper, more diffusely located, and amounting to a positive stippling—giving the epithelium a roughened appearance, as of glass which had been breathed upon.

It is interesting to note, in this connection, that on an intervening and unrecorded occasion, the man returned to the dispensary with a foreign body impacted upon the diseased cornea. My colleague, who was in charge at the time, upon brushing off the particle with a cotton wound spud, noticed that the hazy epithelium at that situation was wiped away also, leaving clear substantia propria beneath. This demonstrates how superficial was the edema.

Upon his return, in addition to an increase in the edema, there was a large, central, bullous loss of epithelium, deeper than the first, and staining markedly with fluorescein. The whitish ring was more pronounced. He was promptly readmitted, and again placed upon a rigid sugar free diet, close questioning having revealed the fact that he had been partaking freely and indiscriminately of starch containing foods. The same local and general treatment was ordered as on the previous visit.

On this occasion a slight transitory hypertony was several times noticed, altho ophthalmotonometry was not resorted to, because of the epithelial disturbances. In fact, the epithelium did not respond to therapeutic and dietetic measures as rapidly as before, and complete restoration did not occur for 18 days. This time the patient complained, once or twice, of slight local pain, which was promptly relieved by instillations of a 1% holocain hydrochlorid solution.

On September 8th he was again discharged from the hospital with the corneal haziness much less marked, while a very dim, undetailed view of the fundus could, for the first time, be obtained with the ophthalmoscope. His vision, 4/100, also showed great improvement. Urinalysis gave a high specific gravity, 1031, but no sugar, acetone, or diacetic acid. In this connection, let it be noted that, while the diet caused a loss of weight, and less healthy general appearance, the corneal disturbance was steadily ameliorated thereby.

He was next seen on October 10th, when his vision had improved to 20/120, and the edematous haze of the cornea had cleared markedly. The iris was clearly visible, but the white ring was still present, while the corneal apex was marked by a small, almost circular, opaque spot, the site of the previous tissue loss.

Four days later, however, when he

brought a 24-hour specimen of urine to Dr. Guerinot, 2% sugar was found, in conjunction with a specific gravity of 1032, altho there were no decomposition products such as acetone or diacetic acid. Strict dietary instructions were again given him, and he was told to instil 5% dionin collyrium locally, each day, in order to stimulate the nutrition of the cornea.

The man was last observed on October 31st, when the cloudiness had diminished greatly, but below the corneal center, and above the white ring, a small cyst had formed, evidently containing a clear liquid. This was directly beneath the epithelium and moved in any direction when pressure was made against it thru the lower lid. Vision had fallen slightly, being 20/160++, altho a 2.25 diopter convex sphere, tried for the first time, brought it to 20/50.

CASE 2. W. M. H., white, 53 years of age, single, a theatrical manager, experienced the first intimation of ocular trouble on Jan. 25th, 1923, while in Wheeling, W. Va., when, because of a little vague annoyance, he consulted a local oculist who prescribed some simple remedy with the immediate alleviation of the discomfort. On March 6th, while in New York, the irritation recurred and, within two days, became so annoying that he consulted Dr. G. H. Bell, who treated his eyes on four consecutive occasions. As the soreness returned severely, in a few weeks, he consulted Dr. C. E. Williams, also of New York, on April 4th, the latter diagnosing "fibrous ulcer of the cornea" and advocating the removal of a molar which proved undiseased and bore out the previous Roentgen diagnosis of normality. On April 18th, he left with his company for Trenton, being turned over, by Dr. Williams, to Dr. Howard Ivins, under whose care he remained from April 20th to July 4th. During this period the use of ultraviolet rays seemed to strengthen and relieve the eye.

On July 9th, he transferred to Long Branch, N. J., and was treated up to Aug. 11th by Dr. W. K. Campbell, who told him that nothing could be done for the eye and that absolute rest alone could avail to relieve him. This he was unable to realize.

On Sept. 13th, 1923, consulted Dr. Dolan of Worcester, Mass., under whose care he remained until Oct. 19th, 1923, when he transferred to Dr. Chapman of Springfield, Mass., whom he deserted after one consultation, enucleation having been advised. It is interesting to note that the patient had noticed a decided lessening in pain or ache, as the months wore on, but an increase in sensitiveness to light and feeling of ocular weakness.

The writer first saw him on Dec. 20th, 1923, when the above history was given, the patient complaining that the eye had been excessively photophobic and weak for the previous week, the vision unusually blurred and lacrimation extraordinarily copious. He was questioned as to his later treatments and it was discovered that he had received no constitutional therapy, whatever, and that he had been under a local atropin regimen for months. Family ocular and previous ocular history negative, but patient had had diabetes for past 6 or 7 years.

Present Condition: O. D. negative. Lids of left eye swollen, palpebral and bulbar conjunctiva congested, the veins of the latter greatly distended, tremendous circumcorneal engorgement of ciliary vessels. Cornea steamy, grayish and lacks luster, sensitiveness impaired, epithelium desquamated centrally, surrounding cells edematous and underlying layers infiltrated. Tension of globe "stony hard" to palpating finger tips—(tonometry not resorted to owing to denudation of corneal epithelium centrally).

O. D. V. 6/6—. O. S. V. Hand movements.

℞. Discontinued atropin and ordered holocain and hot compresses, pilocarpin ½% solution and 5% solution dionin, advising medical consultation with Dr. Walter Baetjer who has epitomized his findings as follows:

"The general data in the case of Mr. H. is about as follows: He is 53 years old. Complainer of diabetes and eye trouble. General health in the past entirely normal.

Present Illness: He has had diabetes for six to eight years but without any effect on his general health unless in relation to his present eye trouble. The trouble with his eye began six to eight months ago with obscured vision. The condition has been variable, but in general, has been progressive since that time. The history is otherwise quite normal except that he has lost from 165 pounds to his present weight of 135.

General physical examination entirely normal except for the condition of the eyes which you know about.

Laboratory Examination: Negative except that the *urine* shows sugar in amount of 3.3% without evidences of any acidosis. *Blood sugar:* 266 mg. per 100 c.c. *Blood Wassermann:* Normal.

On simple diet regulation and insulin the urine became and remained sugar free and the blood sugar dropped to normal. I heard from him the last time on April 14th, at which time his urine was still free and he was apparently feeling very much better. I have, of course, more detailed notes that I will gladly send if you want them."

Under insulin injections and local regimen, eserin being substituted for pilocarpin, tension was reduced from +3. to +2. on Dec. 28th, and normal on the 31st. Later, aspirin was exhibited for the persistent symptoms of iritis and dionin increased to 10% solution. By Jan. 10th, 1924, he was greatly improved, the cornea clearer, the epithelium regenerated and the circumcorneal congestion diminished, while the sense of weakness was less noticeable.

As he had to leave for Cleveland with his company, he was referred to Dr. Clark of that city who continued the same local treatment with the result that, on Jan. 24th, he wrote: "The eye feels pretty good, stronger, and I think the sight a tiny winy bit better."

Next he went to New York, writing, on Feb. 14th, that the "eye has been pretty good ever since I left your care." He was instructed, by return mail, to place himself in Dr. John Wheeler's care immediately, whom he consulted on Feb. 21st, 1924, and who wrote, under date of Feb. 25th, 1924, as follows:

"I found the left eye doing well and Mr. H. was almost free from symptoms. I advised him to continue the treatment you ordered. I should consider your diagnosis the proper one, namely, dystrophia epithelialis corneae.

The slit lamp corneal microscope examination reveals cysts of the epithelium and facets where the cysts have ruptured. The cornea is nearly anesthetic now and there is very little discomfort."

On Feb. 29th, after his second visit to Dr. Wheeler, patient wrote that he had been discharged and told to continue with the same treatment. He added that his eye felt much stronger but that his vision was unimproved.

On March 6th, patient wrote for the last time telling of the continued ocular relief and stating that Dr. Tenney, of the Fifth Avenue Hospital, had just reported both blood and urine "sugar free," and that the insulin injections had been reduced to once daily.

The last report, April 14th, was just as favorable: urine sugar free, blood sugar normal and patient feeling constitutionally and (ocularly) "very much better."

CENTRAL HOMONYMOUS HEMIANOPIC SCOTOMA.

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The patient suffered a severe infection of the malar region followed by cerebrospinal involvement. Recovering from this he is found to have an homonymous hemianopic defect extending from the fixation point downward and to the right to about 5 degrees which remained permanent. This was probably due to a lesion of the occipital lobe involving the radiations of Gratiolet. Read before the American Ophthalmological Society at Hot Springs, Va., June 18, 1924.

Instances of small central portions of the fields of vision being lost in homonymous hemianopsias are extremely rare. Five cases are illustrated by Wilbrand and Saenger.

These scotomata are always congruous and superimposable, altho slight variations in shape and size in the two fields may occur, as existed in the case about to be reported.

The patient was also seen by Dr. John E. Weeks and Dr. Hubert S. Howe of New York, and by Dr. George J. Wright of Pittsburgh, whose unanimous opinion of a discrete lesion affecting the function of the upper mesial portion of the fibers of Gratiolet agrees with the writer's. That the lesion was a result of a violent infection of the face, followed by cerebrospinal symptoms, is most probable.

S. M. C., male, age now 42, had been refracted yearly for the past ten years with an unimportant ocular history; slight changes being necessary in his glasses from time to time for a moderate amount of myopia and astigmatism. The ocular fundi were at all times healthy. Occasionally the patient complained of "seeing spots" which phenomena would disappear upon taking a laxative and regulating his diet. Central vision enjoyed with each eye with correction had always been 6/5.

There had always been a slight inequality of the pupils, the right measuring 4 mm., and the left, 3 mm., both reacting normally to light and accommodation. Mr. C. had always stammered, more noticeably under excitement.

In January, 1923, on his way south, the patient developed an infection of his face in the right malar region which he attributes to an accidental infection in a barber shop.

Becoming rapidly worse, upon arrival at his destination in Florida he was hastened to Cuba by aeroplane, where Dr. Lainè admitted him to the Havana General Hospital, draining a large facial abscess. On the heels of this a secondary submaxillary adenitis developed and symptoms of cerebrospinal meningitis set in, becoming so alarming that Dr. Edward Martin of Philadelphia, who was visiting in Havana at the time, was called in consultation. Mr. C. was so ill for a few days that his life was despaired of; but he eventually became better after two weeks in the hospital, and remained in the south for several months recuperating. His vision was noticeably affected after this experience and he suffered acutely from light, necessitating his wearing colored glasses at all times.

He returned to Pittsburgh in April, complaining of distorted vision described as seeing heat waves but chiefly of being unable to see when looking down, having almost run over a boy whom he did not see while driving his motor car.

The ophthalmoscope revealed an active area of choroiditis in the right eye, with some vitreous opacities, in the inferior nasal region. The superior retinae were edematous and partially detached. The optic discs were normal.

He was admitted to the Allegheny General Hospital, kept in a recumbent position, given hot packs and electric light sweats, aided with pilocarpin and with Donovan's solution internally. The choroiditis subsided, the vitreous opacities disappeared and the edema of the retina was relieved.

Physical examination by Dr. J. M. Long: Blood, normal except for slight eosinophilia. Urine, slight trace of albumin, occasional hyalin cast.

Ewald test meal showed fasting content, 15 c.c. Free acid of 3; total acid of 5. Bile and blood negative.

G. I. tract, slight gastroptosis and enteroptosis.

Heart normal, aorta being slightly wider than normal in the region of the arch.

While in the hospital, three suspicious teeth were drawn, and upon the advice of his physician an appendectomy was performed with the view of benefitting his digestive apparatus.

The first accurate record of his fields of vision was obtained May 6, 1923, after his discharge from the hospital. The fields for form and color were normal in size. Starting at the fixation point and extending to the 5° circle of the campimeter chart on the lower right side, limited above by the 90° meridian and below by the 135° meridian, in each eye there was a triangular, absolute, positive scotoma, or a left hemianopic octantal segment, the central part of the sector only being involved. The outlines of the scotoma were slightly smaller in the field of the left eye.

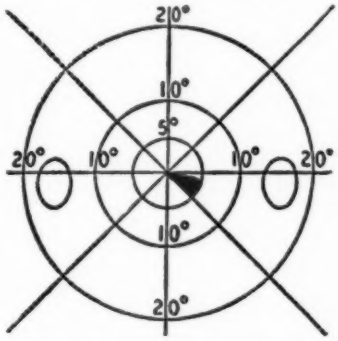

Fig. 1.—Left field in central hemianopsia, wedge shaped defect extending from fixation point.

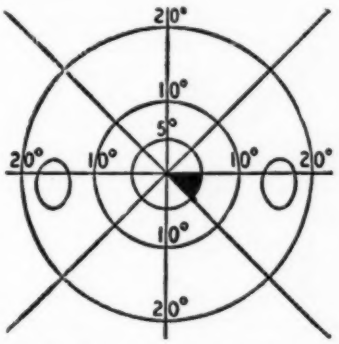

Fig. 2.—Right field in central hemianopsia, sector scotoma extending from fixation point.

Repeated fields taken at about four week intervals until the present time show no change in the size or shape of the scotoma.

The patient's general health is excellent, better in fact than at any time during the ten years he has been under observation.

Dr. Wright's report of his examination follows:

"Mr. S. M. C. was referred to me for a neurologic examination because of a partial right hemianopsia.

The pupils were unequal, the right larger than the left, but normal in reaction. I understand this inequality had been noted by Dr. Stieren for some years, in the course of previous examinations. The other cranial nerves were normal in function, including the sensations of taste, smell and hearing. Various tests of the mechanism of speech were made, but no abnormalities found. The patient had an impediment of speech which friends and relatives asserted had existed for years and had not shown any change. No bad odors and tastes had been noted. Visual memories were good and there had been no visual hallucinatory phenomena.

All the cerebellar functions, as tested by station and gait and by the usual tests for synergy were found to be normal. The tendon reflexes in both upper and lower extremities were active but equal on each side. The plantar reflexes were normal; there was no clonus.

The abdominal reflexes were not obtained on either side, but the cremasteric were present and equal. Various tests for sensation were made covering the face, neck and the rest of the body, and no disturbed function revealed. The sense of position and range of movement particularly was accurate. There has been no paroxysmal pains or emotional disturbances of the type sometimes seen in thalmic disease. Stereognostic sense was normal.

The neurologic examination therefore does not reveal any information that can be associated with the visual

defect. The condition in my judgment is an organic one, due to a small lesion in the visual pathway on the left side behind the chiasm, probably on the left occipital lobe involving the radiations of Gratiolet.

The pathology of the condition cannot be determined on the present evidence, but the fields should be checked from time to time to note particularly whether there is regression or progression. If the latter, the possibility of tumor would be in the foreground."

As the defects in the fields have remained the same size for more than a year and as the patient enjoys excellent health, it is safe to assume that the lesion is an accidental infection of a minute area in the brain; and that there need be no apprehension of anything in the nature of a tumor developing.

ADVANTAGES OF COMPLETE DISCISSION BY THE V-SHAPED METHOD.

McCLUNEY RADCLIFFE, A. M., M. D.,

PHILADELPHIA.

This operation proposed by Dr. S. L. Ziegler is recommended because of its simple technic, rapid recovery and good results. Eleven cases including various forms of cataract are reported. Read before the American Ophthalmological Society, June, 1924.

Simplicity of technic, consonant with the best end results, is the determining factor in favor of all surgical operations.

This was amply exemplified during the World War, when simplification of technic was forced on surgeons by dearth of equipment, and the wonderful results obtained warrant the almost universal statement that simplified technic is uniformly beneficial to the patient in results, and is an economic benefit.

What is true in general surgery is equally true in our special department. This is more and more being stressed in the literature of today and must eventually result in a more simplified surgery of the eye.

The operation we are now discussing was devised a number of years ago by Dr. S. Lewis Ziegler, but not brought forward prominently to the attention of the profession until 1921, when he presented his paper before the American Medical Association at Boston.

He defined, and limited, the term "Discission" in accord with its derivation, to a cutting thru of the entire lens with its capsules, hence the usual term "thru and thru" operation.

The operation has grown in favor during the past three years on account of its simplicity of technic, its safety, its freedom from complications, the lessening of the number of operations, the preservation of the natural mobility and symmetry of the pupils, the economy in time, and expense, and the relief of anxiety of parents.

The technic of the operation is exactly that of V-shaped capsulotomy, except that the incisions are made entirely thru both capsules and cortex, by clean, straight cuts, down and into the vitreous.

The technic of the operation as outlined by Dr. Ziegler, and which I quote, consists of four stages.

First stage.—"Under cocain anesthesia and full mydriasis, the cornea is punctured above with a Ziegler knife-needle turned on the flat. The knife is then rotated, edge downward, the point swung to the left of center and the lens punctured, with a quick thrust, at a point as low as possible, close to the iris margin, but high enough to avoid injury to the ciliary body.

Second stage.—"With a sawing movement in line with the axis of the knife, the lens is divided thru and thru, the incision being carried from below upwards as far as possible, but without pressure on the lens or injury to the iris.

Third stage.—"The knife is then raised up thru the rift of the divided lens and swung across the anterior chamber to a corresponding point on the right of center. The lens is again

punctured and the incision carried as before, thus making two converging or V-shaped cuts. Care must be taken to have these converging incisions *meet or cross* at the apex of the V, in order to free the pupillary area from ultimate secondary cataract after the cortex has dissolved.

Fourth stage.—"The knife is then turned on the flat and withdrawn. The corneal puncture is curetted with an iris spatula and touched with a 5 per cent iodin solution and a light dressing applied."

Preliminary iridectomy, so necessary in the older methods of discission, is absolutely unnecessary in complete discission; and if performed would needlessly mar the beauty of the pupil.

In small children and very nervous patients I employ ether anesthesia, as it is essential that the eye be absolutely fixed, in order to make perfect V incisions.

The small double fixation, or horseshoe forceps, are preferable to the single form, as they hold the eyeball in a fixed position, thus preventing the danger of cutting the margin of the iris, or striking the ciliary body.

The advantage of entering the knife in the cornea, instead of at the limbus is, it obviates the danger of cutting the iris on entrance, and is a better location for the sawing incision thru the lens. The success of the operation depends on sawing, instead of a free cutting movement, which is likely to dislocate the lens.

I use the same dressings as in cataract operations, instilling appropriate solutions of atropin and applying a 1 to 3000 bichlorid ointment, and redressing in twenty-four hours.

I keep the patients in the hospital for several days, especially if they live at a distance that is prohibitory to their reporting within a reasonable time for inspection of the eye.

Occasionally portions of lens matter may drop forward into the anterior chamber, but they dissolve quickly without causing inflammatory reaction. In one of my cases a small particle of calcareous lens matter fell into the anterior chamber and became adherent to the iris without causing any reaction.

One of the chief advantages of the operation to the surgeon is the mental relief afforded by the escape from all of the vexing complications attendant upon the older, or present methods of discission, which harassed the surgeon as well as the patient.

The requisites for a successful operation are:

Good light, preferably artificial.
Complete mydriasis.
Sharp knife-needle.
A gentle sawing motion.
Head and eye in fixed position.
Deep, straight incisions.
Wide V incision.

REPORT OF CASES.

Cases 1, 2 and 3 are sisters, and had hereditary congenital cataracts of both eyes. Their grandmother, and her twin sister had congenital cataracts and the mother of these children, and her brother also had hereditary congenital cataracts. The children and descendants of the grandaunt had normal eyes.

CASE 1.—E. S., aged 10 years, was admitted to the Wills Hospital on January 11, 1923. The lids were normal, corneas clear, anterior chambers of normal depth. The irides reacted normally to light, and dilated regularly under a mydriatic. There was marked horizontal nystagmus and convergent strabismus of left eye. In the center of the right lens there was a large calcareous plaque, and in the left lens the calcareous deposit was smaller than that in the right.

On January 19, 1923, under ether, I did a thru and thru operation on the right lens. There was only moderate reaction, which subsided under mild local treatment the following day.

On February 16, 1923 I operated on left eye under ether. No reaction.

The absorption was very slow, not only in this case, but in all of the congenital cases, probably due to the calcareous type of lenses, thickened capsules attached to the calcareous deposits, and the pocketing of cortex.

On March 15, 1923 she reported at the hospital when I found the absorp-

tion progressing satisfactorily and + 10 D. sph. were ordered for temporary use.

Owing to a series of illnesses in the family, she was unable to report until late in the winter, when I found complete absorption of cortex, and round mobile pupils.

Arrangements were made for final refraction, but at the time she had a very severe attack of acute rheumatism.

Case 2.—H. S., aged 8 years, the second of the three sisters with hereditary congenital cataract. There was marked convergent strabismus of left eye, with horizontal nystagmus. The corneas were clear, pupils 3.5 mm. and reacted normally to light. Lenses were opaque.

On January 19, 1923 I did a complete discission of the right lens, under ether, with no reaction. On February 5, I did a similar operation on left eye with same result.

I last saw this patient on May 29, 1924. The pupils were round and mobile and dilated regularly under a mydriatic. The fundi are apparently normal, but it was impossible to get an accurate view, owing to the rapid nystagmic movements of the eyes.

The present refraction is:

R.+8.=15/82. L.+7.5⌒+1. cyl. axis 90°=15/100, and with +4 added she picked out some letters of J. No. 8.

Case 3.—V. S., aged 5 years, the third of three sisters with hereditary congenital cataract.

She also has marked convergent strabismus and horizontal nystagmus. Corneas clear, pupils 3.5 mm. and responded normally to light, and dilated regularly under a mydriatic. The lenses were opaque with small calcareous deposits.

January 19, 1923 I did a complete V-shaped discission of right lens, under ether, without reaction; and on Feb. 16 I did a similar operation on left eye. No reaction.

I last saw this patient on May 29, 1924. Both pupils are round and mobile. The fundi are apparently normal; but I could not get an accurate picture on account of the very rapid nystagmic movements.

She is wearing +10. for temporary use.

Case 4.—W. S., aged 5 months, congenital cataracts, both eyes. Eye condition noted at birth. Nystagmic movements. The pupils were 2.5 mm. and only dilated to 4.5 mm. under homatropin. Several posterior synechia in each eye.

On October 22, 1923 I did a complete discission of right lens under ether. There was slight reaction for a day or two, which quieted under local treatment. On October 29 discission of left eye was done under ether; no reaction. Discharged November 6.

A pair of +6. D. sph. lenses were made for this baby, and he wears them without remonstrance and with them he can see to pick up little flakes of cereal from the tray of his highchair.

I last saw this little patient about two months ago, when I found the right pupil black, left slight capsular adhesion remaining.

Case 5.—Baby H. M., first seen when 5½ months old. Congenital cataracts both eyes with marked convergent strabismus of left eye. Mother noticed eye condition shortly after birth.

Had convulsions second day after birth. She is an extremely nervous child. On November 12, 1923 I did a "thru and thru" operation on both eyes, under ether. The absorption was very slow, probably due to the anemic condition of the child as she was breast nourished until she was 18 months of age, and is not yet able to walk or stand alone; probably due to deficient nourishment.

The lenses are now absorbed. But there is a narrow border of capsule on the temporal side of left pupil.

Case 6.—T. B., aged 13 years. Had defective vision in left eye since he was a baby, when he was struck on eye with a bottle.

Vision of right = 20/20.

Vision of left = 2/200.

R. fundus normal. L. posterior cortical cataract. He was admitted to the hospital on January 16, 1924.

On January 23, 1924, I did a V-

shaped discission of left eye under cocain. January 25 lens swollen, pupil widely dilated, no reaction. January 30, 1924, discharged.

May 28, 1924, I saw him for first time since he left the hospital. The lens is absorbed, pupil round, fundus distinctly seen and normal.

To be refracted later.

CASE 7.—T. H., aged 11 years, was struck on the right eye with an apple when four years of age causing a traumatic cataract. The vision of the right eye was limited to fingers at six inches.

He was admitted to the hospital on March 26, 1924 and on the 28th I did a V-shaped discission under cocain. There was a very slight reaction, which was quieted under local treatment, and he was discharged on April 2.

I have not seen this patient since he was discharged from the hospital, as he lives a considerable distance from the city, but his mother writes me that the eye is progressing satisfactorily.

CASE 8.—S. C., aged 13 years, was struck on the left eye June, 1923, with a "BB" shot fired from an air rifle.

When he was admitted to the hospital on April 2, 1924 the vision of the right eye was 20/20, left, light perception. The left lens was cataractous and the iris torn from four to six o'clock.

The projection field was normal. On April 4 I did a complete discission under cocain, no reaction, and I discharged him on April 11 and did not see him again until May 28 when I found the lens entirely absorbed, pupil round, fundus normal.

To be refracted during his vacation.

CASE 9.—R. S., aged 4 years. While playing with her doll coach on Thanksgiving, 1923, ran a small wire into her right eye. It entered the cornea at the lower third penetrating the lens, and resulting in a traumatic cataract.

She was admitted to the Wills Hospital on April 16, 1924 and on the 17th I did a V-shaped discission under ether. There was no reaction following the operation and on the 19th the eye being perfectly quiet, and a small clear space in the pupil, she was discharged from the hospital.

I saw this little patient on May 27th and the lens was completely absorbed, and she had a clear, black mobile pupil. The fundus was normal, and the refraction with the ophthalmoscope was + 12 D. sph.

CASE 10.—J. B., aged 24, professional boxer. He noticed vision of left eye failing for the past two years, and for the last eight months vision limited to light perception. The projection field is normal. L. cornea clear, pupil 3.5 mm. and normal reaction. Lens opaque.

I admitted him to the hospital on May 8 and the following day did a complete discission of left lens. The lens broke up almost immediately, showing a clear space at the lower margin of the pupil thru which he counted fingers. There was a slight reaction, a faint blush of the conjunctiva, which faded quickly under mild local treatment. He was discharged on May 14, 1924.

I saw this patient on June 9, just one month after the operation. There was a clear central, round, mobile pupil. The fundus was normal. The refraction was:

O. S.+12. D. sph.⊃+1. c. axis 45° vision = 15/25 mostly, and with +3.50 added, read J. No. 2.

CONCLUSIONS.

I formerly used the linear, or curettement method of operation, which yielded good results with a fair proportion of round mobile pupils. But I have now abandoned it for the V-shaped discission operation for the following reasons:

1. One operation instead of two, three, or sometimes four.
2. No reaction as the swelling of the cortex is in an anteroposterior direction, and consequently relieves pressure in the ciliary angle.
3. No complications.
4. Rapid solution of lens cortex.
5. Marked shortening of time required to accomplish results.
6. Relief of anxiety to the surgeon and to parents.
7. Better vision owing to clear central pupils.

ASTEROID HYALITIS.

REPORT OF A CASE IN WHICH THE BODIES DEVELOPED WHILE UNDER OBSERVATION.

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After a brief review of the subject a case is reported. In a tuberculous patient tuberculin injections produced reactions with diminished vision. Opacities appeared in the vitreous taking the characteristics of asteroid hyalitis. It is suggested that tuberculous deposits under certain conditions undergo calcareous change giving rise to this condition of the vitreous. Read before the American Ophthalmological Society, June, 1924.

Several years ago I reported[1] three cases of unusual vitreous opacities, consisting of those round, white, non-crystallin bodies, occasionally found in the vitreous, called by Benson[2] "asteroid hyalitis"—a name which seems to be generally accepted in this country. At that time my investigation of the literature disclosed only three additional cases. Holloway[3] subsequently reported four cases; and with a more thoro search of the literature brought the total up to 13. Because of lack of harmony in nomenclature, it is possible that with a continued search of the literature other cases might be found. Since Holloway's original report, he has written two other articles [10-11], and clinical cases have been reported by Weidler[4], Tenner[5] and Ball[6].

At the time of my report there was a prospect of obtaining one of the eyes for pathologic examination; but the death of my patient under tragic circumstances prevented my securing it. One of the other cases disappeared from observation, while the third has remained healthy and has been examined periodically since that time with an apparent increase of asteroid bodies. I say "apparent" as they have always been so numerous that they could not be counted.

Verhoeff[7] has been fortunate enough to obtain an eye containing these bodies, which he has thoroly examined. His conclusions are that "the opacities consist chiefly of calcium soap and calcium carbonat, a certain amount of fatty or lipoid substance, in combination of various stages of stability. Their formation is usually found dependent on intraocular angiosclerosis, in association with an altered condition of the blood."

Bachstez[8] has examined two eyes of the same character, also demonstrating the presence of calcium salts in the bodies.

I have recently had a case in which the asteroid bodies developed while under observation, a report of which I feel may add something to the clinical aspect of these cases.

CASE.

E. K., age 31, occupation welder's helper, reported to me on November 27, 1923, thru transfer by the company for whom he was working, due to the fact that I was on their staff of physicians.

HISTORY: He had noticed some diminution of vision about a month previous, apparently caused by floating objects in front of each eye. There was no redness or pain and the condition gradually grew worse. He had consulted Drs. Stephen A. and Frank P. Schuster about three weeks before and had been under treatment by them since that time, with no improvement in his condition.

The Doctors Schuster reported to me that the patient came under their care September 22, 1923, complaining of poor vision, headaches and spots before his eyes, of one week's duration. At this time uncorrected vision of the right eye was 15/50 minus; left 15/50 plus. Examination generally negative except for large numbers of massy, stringy floaters, in the anterior vitreous. Fundus and disc presented no lesion. Wassermann negative; urine negative; X-rays disclosed several apical abscesses of the teeth; and the teeth were ordered extracted.

PREVIOUS HISTORY: General health good, mumps and measles in childhood, tonsillitis once, slight sore throat on the right side a week before, denied venereal disease, married, had two

children age 10 and 3. His wife had one miscarriage about three years ago, now has active tuberculosis. Father and mother living, brother and one sister living and well. Recently he had not been feeling well because of headaches.

EXAMINATION OF THE EYES: Both pupils were dilated from the use of atropin. Vision, right eye 20/40, increased to 20/30 with minus 1 cylinder, axis 150°. Cornea clear, no deposit on Descemet's membrane, marked dark vitreous opacities well forward, but not sufficiently dense to prevent a fair view of the fundus, which disclosed no change. Left eye, vision 20/100, some improvement with plus cylinder, axis 90°. Marked dark vitreous opacities and two long fine silver white strands; a fairly distinct view of the fundus, which disclosed no change. Physical examination by Dr. Orville Egbert, who reported the chest slightly emphysematous, fremitus normal, chest exhalation very good, character of breathing prolonged expiration, latent rales in the infra- and interscapular region of both lungs; heart negative; Wassermann negative; urine negative; temperature normal; diagnosis, incipient tuberculosis. Examination of the nose, negative. X-ray of the sinuses, negative. Tonsils small, with no sign of inflammation.

Being suspicious of tuberculosis, owing to his physical condition, and owing especially to the silver strands found in the left vitreous, an investigation was started along this line. On December 4, 1923, 1/1000 of a milligram, of old tuberculin was given subcutaneously; on the 6th, 1/100 of a milligram; on the 8th, 1/100 of a milligram was repeated; on the 12th, 1/10 of a milligram was given. With the last dose there was a local reaction at the site of injection, general reaction indicated by a temperature of 99°, complaint of general malaise and headache. The focal reaction was shown by a decrease in the vision. On the 15th, 1/10 of a milligram was repeated, at which time he complained of intense headache, burning of the eyes, with marked decrease of vision. Chest examination at this time revealed an extended exaggeration of the rales in the left supraclavicular region.

Examination of the eyes disclosed no change other than decrease of vision, with a feeling of general improvement in sight several days after each injection. The dose was reduced to 1/100 of the milligram, which was continued weekly until January 2nd, when this dose produced a definite local reaction, marked headache, diminution of vision (vision the day before having been better than usual). The next dose, on January 9th, was 1/1000 of a milligram which also produced a definite reaction.

The pupil was kept dilated with atropin and an examination made every second day up to January 3rd, at which time atropin was discontinued. On January 16, 1924, both pupils were dilated with homatropin, and at this time the right eye showed a number of white bodies bound together with a dark line of stringy opacities. They were semiglobular in form, with a rather irregular outline, not as smooth as those seen in my previous cases. The left eye disclosed practically the same condition, but the asteroid bodies were fewer in number. *Diagnosis:* bilateral tuberculous cyclitis, with exudate in the vitreous.

The case was referred to Drs. Schuster and Schuster for examination. They confirmed my views that at no time previously had there been asteroid bodies present.

The case has been continued under weekly doses of tuberculin and the dark vitreous opacities are gradually disappearing from the right eye. The darker opacities in the left eye are also gradually disappearing and the asteroid bodies have decreased in number.

DISCUSSION: So far, clinical investigation has developed nothing definite regarding the etiology of these bodies, and it is doubtful whether the investigators who found calcium salt have added to our knowledge. Wells, speaking on the subject of calcification says: "It is a universal principle that calcium salts are laid down in necrotic tissue, and are for that matter in nonliving permeable material,

whether dead tissue, avascular hyalin connective tissue, or extraneous foreign material such as silk sutures, gauze drains, etc., which cannot be absorbed. The reason for this is not yet understood." Of the theory of calcium salts first being precipitated as a calcium soap, he says, "there is no microchemical test specific for these products. In the examination of calcified tissue of many origins and stages of calcification, there never has been found calcium soap in appreciable quantities."

Therefore, we are compelled to believe that the primary origin of these bodies is of an organic nature and they later become calcified—at just what stage of their development, it is impossible to determine.

My experience in this case would suggest that in as much as the bodies appeared after a dose of tuberculin producing a reaction, they were a tuberculous exudate of caseous material, which Wells says, "is a coagulation necrosis, made up of protein and finely divided fat, which has the same general character as cheese. They remain for a long time without absorption because of lack of chemotactic substance, but when this substance is supplied by mixed infection and the leucocytes enter, softening takes place."

This is in line with the present day teaching of tuberculosis, that is, that there are two types, one consisting of fibrinous exudate which remains unchanged for many years, and which is disposed to calcify; the other, a mixed infection, in which the tissue softens.

The age of Verhoeff's case was 75, and there is no means of determining just when the deposits originally formed, or when the process of calcification started. The ages of the cases of Bachstez are not given.

In order for my deduction to be correct, the clinical findings must be in harmony with general and localized tuberculosis. In this case active tuberculosis was found in the lungs, which is contrary to my usual experience, as the majority of cases I have treated proved negative on physical examination. The general and local reactions were positive, as were the focal reactions of the lungs. The complaint of the patient of decreased vision and the appearance of the bodies in the vitreous following the diagnostic dose were the only focal reactions in the eye that could be determined. The first symptom is of common occurrence in other cases of tuberculous vitreous opacities which I have treated. In addition, there was a gradual disappearance of the dark vitreous opacities in both eyes, with a decrease in the asteroid bodies, and a complete disappearance of the white silvery strands of opacities during the course of the treatment with tuberculin. There have been found in connection with asteroid hyalitis, choroiditis, retinal hemorrhage with glaucoma, detached retina, and nebulae of the cornea, all of these being suspicious of tuberculosis.

CONCLUSIONS.

My experience in this case, and the investigation of others, seem to warrant the following conclusions:

(1) That the asteroid bodies are probably an exudate secondary to a tuberculous cyclitis.

(2) That the earlier they are discovered and treated, the greater the possibility of their absorption.

(3) That should they remain unabsorbed for a sufficient length of time, they become calcified.

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INTRAVENOUS USE OF SODIUM SALICYLAT IN OCULAR INFLAMMATIONS.

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Given intravenously, salicylates produce no unpleasant symptoms; and the technic of the method is not difficult, as here described. Appropriate doses are available, put up in ampules. In ocular disease the value of this method is illustrated in iritis, scleritis, infection from penetrating wounds, after cataract extraction, etc. Read before the Section on Ophthalmology, American Medical Association, June, 1924, and published here thru courtesy of the Journal of the A. M. A.

Sodium salicylat has for years been recognized as a valuable agent in the treatment of many forms of intraocular disease. The one drawback to its use has been the stomach disturbance it so frequently creates. Something like a year ago I had a sore throat and felt that the salicylates would help it, but I have a stomach which is completely upset by even five grains of aspirin. Some one suggested trying sodium salicylat intravenously. I did so and found it worked like a charm, as it created no stomach annoyance or other unfavorable symptoms.

At this time I had under my care a patient with a violent case of iritis, who was suffering great pain. Numerous posterior synechiae existed which had not broken away after a number of days use of atropin. I gave this man a fifteen grain ampule of sodium salicylat by the vein. He reported the following day that in an hour's time the eye was free from pain, and the improvement I found was amazing. All the synechiae had broken loose, the muggy aqueous was much clearer and the ocular redness was fifty per cent less. This patient was given a fifteen grain ampule of sodium salicylat every day for five days, when it was discontinued because the eye was almost free from inflammation.

Since then I have had this experience repeated so many times that I have come to believe in the efficacy of this treatment in acute iritis.

Quite recently I have had a most striking case of infection following an iridectomy preliminary to cataract extraction. On the fourth day the eyeball was highly injected and the anterior chamber one-third full of yellow exudate. The eye was very painful and it looked as tho we were going to have a time of it. The patient, at once, was given an intravenous injection of the salicylat. In a few hours his pain was gone and the next day the hypopyon was reduced by half. The intravenous injections were continued daily for a week, when the eye was free from inflammation, all the anterior exudate absorbed and the eye went on under atropin to a complete recovery.

I have found sodium salicylat of value in the after treatment of cataract extraction, where iritis was causing pain and inflammation. A few daily injections and the inflammation quieted down and rapid recovery followed.

This method of treatment has given great satisfaction in penetrating wounds of the eye with infection. I have tried it promiscuously in all kinds of uveal, corneal, and scleral inflammations and have yet to see a case in which the results have not been very favorable and at times so striking as to make one feel very enthusiastic over its almost magic like action.

The method of administration is as follows: The pure ethyl sodium sal-

icylat is prepared in ampule form by a number of pharmaceutical houses. Usually the 5cc. ampules contain fifteen grains of the salicylat and the 10cc. ampules twenty grains of the drug. I usually use the smaller dose because the 5cc. syringe is more convenient to use and that dose of the salicylat seems to be large enough.

The bend of the elbow is selected as the place for injection. A piece of rubber tubing eighteen inches long and one-fourth inch in diameter is stretched tightly around the arm above the elbow, and clasped together with a pair of artery forceps to stop the venous circulation. The previously sterilized 5 cc. glass syringe armed with a number twenty-four gage needle is filled with the contents of the ampule. The arm is stroked from wrist to elbow to accentuate the prominence of the veins and the largest vein at the bend of the elbow is selected. Its surface is painted with iodin, the needle is pushed slowed thru the skin and then thrust into the vein for about half an inch, the direction of the needle being upward. If the needle is free in the vein, a slight withdrawal of the piston of the syringe causes a little blood to be drawn back into the syringe. No attempt should be made to inject the contents of the syringe until the blood comes back into the syringe and the rubber tubing has been released from the arm. If the needle is not in the vein but is outside it, or thru it, blood will not flow back into the syringe and an attempt to inject will be attended at once by violent local pain and swelling at the site of the injection.

When blood shows in the syringe, the arm constriction released and the needle not moved, the contents of the syringe can be slowly injected without the slightest pain. Sodium salicylat when injected into the tissues is a violent irritant and there are very few people who will stand for the injection of more than a few drops of it. Every now and then we find a subject whose veins are very poorly defined even when the return circulation is constricted. In such a one it is best to select the median cephalic vein. It lies a little deeper than the more superficial veins and is to be found by palpation after the arm is constricted by the rubber tube. This vein is large in caliber and is to be found at about the center of the bend in the elbow. After the injection is made a piece of cotton should be pressed down on the vein over the needle, the needle withdrawn, and pressure continued for a little time to prevent a hematoma forming from escape of blood from the needle puncture in the venous wall. I had one patient who received daily injections into the median cephalic vein for a week and the area of punctures was confined to a place not exceeding one inch long by one-fourth inch wide.

Sometimes I think, as I grow older, that I am becoming a therapeutic nihilist because so few drugs, outside a few socalled specifics prove worth while after an extended trial. I hope I am not going to be disappointed in sodium salicylat intravenously administered.

I do not venture to hope that I am offering you an original procedure in the treatment of ocular inflammations. No doubt others have used it and, if so, it is to be hoped they will, in this discussion, tell us of what value they have found it.

I do not for a moment claim that it relieves us of the necessity of finding and eliminating the cause of ocular disease, whether it be a focal infection or otherwise. The intravenous administration of sodium salicylat is not going to prevent a recurrence of the iritis, the uveitis, the episcleritis or whatever is under treatment. The constitutional cause must be found and removed. It is gratifying to know that we have in this treatment something which will relieve pain promptly and which will materially shorten the course of the attack.

PROGRESS OF SENILE CATARACT UNDER HYGIENIC CARE.

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DENVER, COLORADO.

This is usually slow and often permanently arrested. Knowledge of the probable rate of progress under good hygienic conditions is necessary for an intelligent prognosis and for judgment of the value of any particular method of treatment. This paper is based on cases remaining under observation more than two years after the beginning of the lens opacity. Details regarding these cases are recorded in tabular form in the Transactions of the American Ophthalmological Society before which the paper was read June, 1924. Illustrative cases are herein included.

In 1876, Mrs. T., the mother of a former member of this society, a great reader, found much difficulty in reading her magazines. Dr. George C. Harlan found that her vision was greatly reduced by opacity of the crystalline lens in each eye. She was seen by Dr. William F. Norris and Dr. William Thomson, who agreed she must give up all reading, and wait for the cataracts to "ripen"; that probably within two or three years, they could be removed. She waited two or three years without noticing much change in her sight.

Then, one day she picked up the Atlantic Monthly and found she could read it easily. With the consent of her former advisors, she cautiously resumed reading. I saw her in 1890. Her lenses then presented dense opacities in the periphery; but each had a comparatively clear opening in the center, thru which she read easily and continued to do so until her death about three years later.

Almost forty years ago, Dr. George C. Harlan one day called my attention to lens opacities in a patient, remarking that they looked like those that were likely to increase rapidly. As we spoke guardedly in subdued tones about their character and prognosis, the patient, a woman, spoke up saying: "Oh, you need not be afraid to talk to me about it. I was told six years ago I had cataracts and would have to have an operation in six months, and my sight has not grown any worse since."

Each year since then, and generally several times a year, patients have come to me who had been greatly alarmed by being told that they had cataract, must wait until useful vision was lost, and then undergo operation. The great majority of these patients have retained useful and fairly satisfactory vision to the end of life; and have been as grateful for the removal of their dread, as they could have been for the removal of their cataracts.

In the last forty years various plans have been exploited for preventing or curing cataract without operation; as treatment with electricity, instillations of atropin, or glycerin, potassium iodid solutions, internal administration of iodids, massage of the eyeball, dionin applied locally, X-ray treatments, subconjunctival injections of sodium chlorid, mercuric cyanid, radium, injections of phacolysins, etc. Every one of these proposed cures has been supported by a series of cases in which the progress of the cataract was "arrested" for a time, and by isolated cases of marked improvement, like the first case above mentioned.

No exact or valuable prognosis with regard to cataract can be given without a basis of knowledge of its usual course under favorable and unfavorable, general conditions. No sound estimate of any method of nonoperative treatment can be formed, without an understanding of the general course and rate of progress of lens opacities, under the ordinary conditions in which our patients live and use their eyes.

This paper gives the writer's experience with the progress of lens opacities under conditions of good, general and ocular hygiene. It is based on the usual observations with the ophthalmoscope, by focal illumination and tests of acuteness of vision that have been in common use. None of these cases was observed in the beginning with the "corneal" microscope under high illumination. These later methods of examination show lack of transparency in every lens, and doubtless will ultimately greatly advance our knowledge of the natural history of

cataract. But until we learn more of the significance of what they reveal, they may prove confusing and misleading rather than enlightening. In this matter a rather long perspective of observation is essential.

The chief basis of this paper is furnished by notes of 593 consecutive cases seen in private practice, showing lens opacities in patients over fifty years of age, whose history gave no indication that trauma or intraocular disease had been an original or etiologic factor in the case; and in whom the form, progress and history of the case indicated the opacity was not congenital or developed in early life. Of these 539 cases, 67 were first seen with the opacity so far advanced as to reduce vision in the affected eye to less than 0.1, or to show no red fundus reflex thru the dilated pupil.

Of the 471 patients coming with partial senile lens opacities, 108 remained under observation for more than two years. Certain main facts ascertained or observed in each of these cases are presented in tabular form. (See Transactions American Ophthalmological Society, 1924.) It may be noted that in 21 of these patients, the cataract in one or both eyes matured, so that removal of the lens was done (op.) or was advised. In some of the cases, the operation was done by the writer, and in other cases by other surgeons. When the corrected vision thus obtained was known, it has been given.

As throwing light on the age at which senile cataract begins, it must be noted that a great many patients were first examined when the lens opacity was quite well developed, and often several years after it had begun to interfere with vision. The age of the patients when first seen was, on the average, higher than the age at which they began to develop lens opacity. Again, it is probable that in those patients in whom the lens opacity developed after they had come under observation, the age of onset was greater than the usual.

Among 732 patients over fifty years of age who came in a certain shorter period for all kinds of ocular conditions, 391 or 53.4 per cent showed lens opacities. Of the 108 patients under observation two years or more, the age at which they were first seen was:

Between 50 and 60 years, 24.
Between 60 and 70 years, 59.
Between 70 and 80 years, 24.
Over 80 years, 1.

Among ten patients in whom the media were clear when first examined, but who later showed lens opacities, the average age, when the opacities were noted, was 70.7 years. But some of these had not been seen for several years, and the histories indicated that lens changes had begun considerably before they were observed.

As to the visual prognosis: There were 9 patients, in whom lens opacity was noted, under observation on the average of 6.3 years each, in whom vision in the better eye never fell below 1.1. There were also 15 patients, observed 4.1 years on the average, who retained V=1.

There were 20 eyes, 9.6 per cent, in which, while under observation, vision improved to the following extent:

10 more than 0.1.
8 more than 0.2.
1 more than 0.4.
1 more than 0.6.

There were 45 eyes in which the vision did not at any time diminish. There were 100 eyes in which the vision did diminish. The average rate of such diminution, from the time of the first observation until the last, an average period of 5.6 years, was:

Less than 1 per cent per year, 80
Between 1 and 2 per cent per year, 13
Between 2 and 3 per cent per year, 6
Between 3 and 4 per cent per year, 1

From these summaries it is evident that in 14.5 per cent of the patients under observation an average of almost five years, vision in the better eye remained standard, or above; that in 20 eyes there was a net increase of vision of more than 0.1 in 9 per cent, and that in 100 eyes in which vision did diminish, such diminution was less than 0.1 per year in 80. The average yearly diminution was really but little over 1/20.

For a patient of the average age, of this series 65.35 years, presenting commencing senile cataract, the probability

is that under proper hygienic care, it will be twenty years before the cataract becomes mature and fifteen years before he loses the power of reading ordinary print. The average expectancy of life at sixty-five is ten years. This agrees with the relatively small number of people who become blind from cataract.

In forming a prognosis, it must not be supposed that all forms of lens opacity have the same significance. The radiating striae in the cortex, generally in the anterior, peripheral cortex, rarely diminish. I have never seen them disappear, altho cases are on record in which it is reported that this occurred (Connor, Sec. on Ophth., A. M. A., 1907, p. 118). It is easy to mistake for such striae the appearances caused by irregular lens astigmatism; the black lines of which look like opaque striae under a certain illumination, but disappear as the direction of the light is shifted. It is probable that such radiating black lines, due to the refraction or reflection of the light, have sometimes been taken for radiating opacities and so recorded.

The network opacities, generally situated in the paranuclear layer of the lens, are more likely to diminish, but do not often clear up. I have no record of their having cleared entirely. They commonly are lost to sight in the general clouding of the lens.

What has been designated as general haziness of the lens is much more likely to clear up. In the cortex I believe it usually clears up, even at the time that cortical striae are increasing. It may also partly clear in the nucleus, especially the superficial layers. This clearing up of a general haze accounts for the improvement of vision that occurs in a considerable portion of cases of partial cataract. It is attended by a corresponding clearing of the ophthalmoscopic image, even when cortical striae persist and become more sharply defined as the haziness between them disappears. When the haziness has come on quickly with an acute disturbance of ocular or general health, it is almost certain to disappear, if the local or general health is restored. Even for chronic general haze involving the nucleus, if the cause of disturbed nutrition can be removed, the prognosis is rather good. Where the cause of disturbed nutrition cannot be removed, the haziness persists, increases and the vision declines with comparative rapidity. No attempt has been made to deduce from this limited series, the local or general conditions that favor rapid, or slow, development of lens opacities.

The conditions under which the above results have been obtained are:

(1) Avoidance of eyestrain by proper change of glasses whenever required; good conditions of illumination; and limited periods and maintenance of proper distance for near work.

(2) Preservation of good general health and nutrition, including the taking of sufficient water in the daily diet.

(3) The proper treatment of ocular diseases that may be associated with lens opacities, particularly uveal inflammations.

In a few of the cases here tabulated, atropin was used in very weak solution, 1:1000 to 1:20000 to improve vision by dilating the pupil; but no great beneficial influence could be ascribed to it. Dionin was also used for a time in a few cases, without any marked beneficial effect. Neither radium, X-ray, nor subconjunctival injections were used in any way.

ILLUSTRATIVE CASES.

The following cases indicate what might be called the normal course of senile cataract.

Case 2. In 1902, Mrs. A. E. E., aged 59, was first examined. She had some headache, her eyes felt badly. She had been wearing glasses for distance nine years, R. and L. +1.50 sph., the last four years; and for near seeing was wearing R. and L. +4 D.sph. She was given for distance: R. +2, L. +2.25 with +2.50 sph. added to each for near work. With these V.=R. 1, L. 1+. The ophthalmoscope showed in each eye a faint haze of the lens nucleus.

Three years later, she thought the glasses were not quite so good as they had been.

R. +2.25⌒+0.37 cy. ax. 98° gave 1.1
L. +2.50⌒+0.25 cy. ax. 85° gave 1.1

These were prescribed with +2.75 added for near work. The haze of the lens nucleus seemed unchanged.

In 1911, six years later, there had been no change in the correcting lenses, but with them vision had fallen to 0.9 in each eye. There was now a fine network of opacity in the deep cortex. The fundus appeared normal; but the optic discs more red, probably because of haze in the media.

In 1913, vision, with the above glasses, had fallen to R. 0.2, L. 0.5, and was better, without lenses, R. 0.5, L. 0.4. A change of lenses brought up the vision again.

R. +0.25 sph.=0.8.

L. +1.50⌒−1. cy. ax. 10°=0.8.

There was now a distinct network of opacity in the peripheral cortex of each eye, most marked in the lower nasal quadrant of the left.

In 1915, February, the vision without glasses had fallen to R. 0.1, L. 0.3. Both eyes had become distinctly myopic, requiring:

R. −2.50⌒−0.50 cy. ax. 135°=0.7.

L. −1. cy. ax. 10°=0.8.

Nine months later, November, 1915, she was holding things very close to her eyes, and got the best vision with:

R. −4.50 sph.=0.65.

L. −1.⌒−1. cyl. ax. 10°=0.75.

The crystalline lenses were distinctly more hazy, with scattered opaque dots in them.

1916, December, she read little except in the early morning. Vision: R. 0.2, L. 0.5. The haze of the nucleus was greater in both eyes.

1918, March. The lenses chosen were: R. −7.=0.3, L. −7=0.3. The ophthalmoscope showed good fundus reflex, interrupted by dots of opacity in all directions. In the left eye the opacity was almost complete in the lower nasal quadrant, toward the periphery of the pupil.

1919, April, the same lenses were required, but they gave vision of only R. 0.1, L. 0.2. The crystalline lens was removed from the right eye. This restored vision of 0.8, with R. +10.50⌒ +2.50 cy. ax. 10°.

But vision gradually deteriorated. The patient was found to have diabetes mellitus, fairly controlled by diet. Without marked fundus change, vision fell to 0.2 before her death in June, 1922. The left eye was not operated upon, vision falling to less than 0.1, twenty years after the lens opacity was first noticed.

Case 58. Mrs. M. L. was first seen in 1900, when 45 years of age. She was given glasses for H. astig. and P. Her media were clear and fundus normal. In 1903, it was noted that her lenses were still clear, but there were a few cholesterin crystals in all parts of the vitreous. These "did not float or show any more motion than in a normal vitreous." They varied in size from mere points "to broader than the largest retinal vessels". There were no other vitreous opacities.

Correction: R. −0.25⌒−0.62 cy. ax. 170°=1.2. L. no glass improves V=1.2.

In 1906 the cholesterin crystals were more numerous in R. but no more in L. The crystalline lenses were still clear, but vision had fallen. She now required for correction:

R. −2.25⌒−0.50 cy. ax. 30° V.=0.5.

L. −0.37 sph. V.=0.9.

1912. She returned, right showing faint nuclear haze of lens; and left two cortical striae below. The cholesterin crystals were more numerous in the anterior vitreous, and showed moderate movement. Some years before, she had been found to have slight diabetes; but under proper diet the urine was kept almost free from sugar.

Lenses: R. −1.50⌒−0.25 cy. ax. 20° V=0.3. L. +0.75⌒−1. cy. ax. 130° =0.8.

1915. The diabetes was still easily controlled. The vision of the right eye had steadily declined to 0.02, not improved by lenses. The nuclear opacity had increased, and the cortical striae had greatly increased.

L. +0.50⌒−0.75 cy. ax. 110° V=0.7. There was some nuclear haze and more cortical striae.

1917. Right showed dense nuclear opacity, with three specks in the anterior cortex and faint fundus reflex at the periphery.

V.=R. 0.01.

L. −1.25 cy. ax. 80° V.=0.9.

There were a few white spots in the retina (twice the diameter of the larg-

est retinal vessels) mostly in the macula. The media are almost clear.

1921. Sugar at times in urine. R. brownish nucleus, thin layers almost clear cortex. V. hand movements. L. a few points of cortical opacity. Fundus spots less noticeable. —1. cy. ax. 85°=0.6. The diabetes remained well under control until her death in 1922.

Comment. In this case it is doubtful if diabetes was an important factor in causing cataract, altho the variations of the refraction in the right eye suggest such a factor. The nutrition of the right eye had evidently been abnormal, as shown by the cholesterin in the vitreous years before there was any opacity in the lens. The chief decline in visual acuity of the left eye was not dependent on changes in the retina. Altho the white spots decreased and practically disappeared, it is probable that the essential changes in the macula remained permanent.

Case 68. P. W. J., U. S. Army, while in the Philippines contracted tropical dysentery and noticed failure of vision eighteen months ago, in 1901. There was some improvement of vision since. There was nuclear haze of each lens, and the fundus was slightly blurred but especially in R.

R. +3.50⌒—1.25 cy. ax. 85°=0.6.
L. +2.37⌒—1.12 cy. ax. 145°=0.9.

1904. The lens opacities appeared as before. Correction gave:

R. +2.75⌒—0.62 cy. ax. 100°=0.8.
L. +3⌒—0.50 cy. ax. 90°=0.6.

1907. The refraction had changed slightly, requiring:

R. +3.50⌒—0.75 cy. ax. 100°=0.7.
L. +3⌒—0.25 cy. ax. 75°=0.9.

There was slight monocular diplopia when looking at lights. He still read a good deal.

1911. He saw at a distance better without the above glasses, so he stopped wearing them. He now required:

R. +2.75⌒—1.50 cy. ax. 15°=0.6.
L. +1.50 sph.=0.04.

Vision for both near and distance was improved by dilating the pupils. Atropin 1:8,000 was dropped in each eye at night.

1913. The nuclear clouding cut off the fundus reflex. There was a thin layer of almost clear cortex in each eye. Vision was: R. 0.08, L. moving shadows. The cataract was removed from the left. But vision continuing good in L., the cataract of R. was not removed, and he died six years later.

In this case, the history indicated rather clearly that the lens opacity began during acute illness from dysentery and subsequently improved decidedly, so that fourteen years elapsed before operation was advisable. The vision obtained by operation proved there had been no serious, permanent damage to the posterior segment of the eye.

In a case not included in this series, Mrs. R. D., aged 56, came with the history of impaired vision. After an attack of influenza three years before, her vision was greatly impaired but subsequently improved. She recently had another attack which reduced vision, so that again she could not read. The lenses were very hazy, so that the disc and largest vessels could just be seen. Vision: R. 0.06, L. 0.06, not improved by lenses. Nine months later V=R. 0.12, L. 0.07.

Two years later this patient returned with the history that her vision continued to improve until two months ago, she had another attack of influenza and her vision had gone down again. It was: R. hand movements, L. 0.02. Removal of the almost completely opaque right lens gave vision of 0.2 with glasses.

In four of the five cases above cited the progress of the lens opacity rendered operation necessary. In the majority this is not the case. The following were followed thru to the close of life, retaining the vision they had when first seen, or enough to continue their accustomed occupation without material hindrance.

Case 97. W. G. M., age 80, had been a printer and since his retirement, a constant reader, reading on the average twelve hours a day. He had begun wearing glasses at the age of 55. His correction and vision were:

R. +0.50 cy. ax. 25° V.=0.4
L. +0.50 cy. ax. 160° V.=0.4

He was given +3. sph. additional for reading. After five years he required:

R. +1.50⌒−0.50 cy. ax. 105°=V. 0.4
L. Vision 0.2 not improved by glass.

When first seen, he had dense cortical opacity in each lens, involving the periphery and extending into a 4 mm. pupil. No visible change occurred in this opacity, and he continued to use his eyes freely in the same way until his death at the age of 88.

Case 70. P. D. T., never wore glasses until he was 75 years old, when he had been given R. −9, L. −2.50 sph. After this he had the left eye operated upon for cataract and lost it by infection. He came to me at 78, with a hazy nucleus allowing a moderate fundus reflex, but not the seeing of any fundus details. By dilatation of the pupil with atropin 1:18,000 he got vision 0.02, which continued to enable him to follow his usual occupations until his death at 81.

Case 29. H. W. R., aged 70, came in 1914 with marked haze of the right nucleus and still more of the left. His correction gave.

R. −2.⌒−0.50 cy. ax. 85°=0.5
L. −4.⌒−2 cy .ax. 120°=0.5.

His myopic astigmatism continued to increase until 1917 he required:

R.−3.⌒−1.50 cy. ax. 60° V=0.5
L. −5.50⌒−3 cy. ax. 115° V=0.5

But he continued to look after his property and to play golf until his death at the age of 74.

Case 36. Prof. H. B. A. came to me in 1904, aged 78, suffering from optic atrophy with low tension or glaucoma. His lenses showed faint nuclear haze. R. V.=0.04, excentric with greatly restricted field and this eye soon became blind. L. had V.=0.5 with nasal field already reduced and disc cupped to the edge. He was not urged to have an operation, but was kept on pilocarpin and eserin without much deterioration of field or vision until after six years he tried going without drops, and his field contracted seriously and V. fell to 0.2. There was nuclear opacity that prevented seeing fundus details thru his narrowed pupil; and his field continued to contract. But with his narrowed field he continued to have V.= 0.02 until his death at the age of 92.

Some patients, under observation longer than the above, are still living, making use of their eyes to carry on their accustomed occupations and amusements.

Case 38. Mrs. J. V. M., age 70, came to me in 1908 with nuclear haze of each lens and cortical striae of the lower quadrant, worse in R. With correction:

R. +3⌒−0.37 cy. ax. 90° V.=0.7
L. +2.75⌒−0.25 cy. ax. 90°=0.6.

At the age of 76, chronic degenerative changes in the left macula were observed which in four years gradually cut down the visual acuity to 0.15. She went to a colleague of good training and experience who extracted the lens from that eye without material improvement of vision. After two years, she returned to me. In fifteen years the right eye has had eight material changes of its correcting lens.

In November, 1923, it required:

R. +6.⌒−3.75 cy. ax. 82° V.=0.6

The cortical striae had increased a little in fifteen years, but the lens substance between them is quite clear. With +3.50 sph. added, she uses her eye freely for reading and other work.

Case 69. P. M. E. had irregular astigmatism with H. As., and had been under my observation and care for twenty-four years; with clear media when she came to me in 1904, aged 63, with general haze and faint cortical striae of both lenses. She had worn for seven years:

R. +1.25⌒−0.75 cy. ax. 155° V.=0.9
L. +1.25⌒−0.75 cy. ax. 10° V.=0.8

Vision had gone down and her correction now was:

R. +0.75⌒+0.62 cy. ax. 80° V.=0.9
L. +1.12⌒+0.62 cy. ax. 115° V.=0.7

She was given the above with +3. added for near work and instructed to increase the amount of water taken which had previously been very inadequate. In the twenty years that have intervened she has had four material changes in her glasses. The last correction in 1923 was:

R. +1.75⌒−0.75 cy. ax. 135° V.=0.5
L. +2.⌒−1. cy. ax. 45° V.=0.4

She has used her eyes freely with the help for the last two or three years of a reading glass for fine print.

Case 74. Mrs. R. C. E., age 68, had been under my care and observation

for thirteen years, with clear media until she came for failing vision in 1911. She now showed some general haziness of lenses. With:

R. +1.25⊂+0.50 cy. ax. 180° V.=0.6.

L. +1.75⊂+0.37 cy. ax. 180° V.=0.7.

She was instructed to use water more freely than she had been doing.

In 1914, the general haziness had been replaced by "scattered, small faint clouds with clear lens substance between." Her vision had improved and with:

R. +0.62 cy. ax. 25° V=1.1

L. +1.75⊂−0.50 cy. ax. 100° V.=1.1

In 1918 her eyes showed a change of refraction in the direction of myopia.

R. −1.⊂−0.50 cy. ax. 95° V.=0.9

L. +1.⊂−0.50 cy. ax. 65° V.−0.9

At 83 there has been no material change in vision or refraction. She still reads twenty minutes at a time without harm. Lens no more hazy, cortical clouds as before.

Case 83. Mrs. S. F. M., then aged 69, was first seen in 1900 with slight nuclear haze of the crystalline lenses. With:

R. +1.25⊂+0.62 cy. ax. 15° V.=1

L. +1.⊂+0.50 cy. ax. 175° V.=1.1

She was seen in 1901, 1904 and 1907 without material change. In 1909, altho the lenses looked as before, there was a change toward inverse myopic astigmatism. With:

R. +1.⊂−2.25 cy. ax. 105° V.=0.6

L. +1.75⊂−1. cy. ax. 85° V.=1.

When last seen at the age of 84, the lenses showed more nuclear haze. With:

R. −1.25⊂−2. cy. ax. 100° V=0.6

L. +1.⊂−1. cy. ax. 80° V.=0.6

Case 45. Mrs. J. H. W. who had been under my care for glasses for twenty-four years before, came to me at the age of 73, wanting to have the glasses changed that I had prescribed fourteen years before. She had not noted any decided failure of vision, until the last year or two. Her correction was:

R. +0.75⊂−1. cy. ax. 10°

L. +1.25⊂−1.12 cy. ax. 180°

and had originally given V.=1.2 in each eye. They now gave R. 0.3+, L. 0.3−. She wore +2.75 added for near work.

The crystalline lenses, which had been clear when the glasses were ordered, were now hazy thruout and there were striae in the deep cortex, most numerous in the lower nasal quadrants. Her correction was now:

R. +1.50⊂−0.50 cy. ax. 160° V.=0.8

L. +1.50 sph. V.−0.8

With these and +3. sph. added for near work, she is entirely satisfied.

Case 53. Mrs. L. H. A. came to me in 1914, aged 65. She had many cortical striae of lens opacity, some extending to the center of the pupil. She had been very much upset by learning she had a "cataract." Her correction was:

R. +1.25⊂−1.25 cy. ax. 135° V.=1.1

L. +1.⊂0.62 cy. ax. 70° V=1.

When last seen in 1920, she required.

R. +1.⊂−1. cy. ax. 135° V=1.−

L. +1.⊂−0.50 cy. ax. 70° V=1.−

Her father lived to be 87, and had "cataract," but was able to read with glasses until the end of his life.

Case 64. O. P., aged 67, had been myopic many years. He came to me in 1907 with clear media, wearing:

R.−5.50⊂+0.75 cy. ax. 15° V.=0.7

L. −4.50⊂+1.25 cy. ax. 170° V.=0.9

In 1909, things were getting dim and there was moderate, general haze of each crystalline lens. Correction now was:

R. −7.50⊂+1.25 cy. ax. 9° V.=0.4

L. −6.⊂+1.25 cy. ax. 168° V.=0.8

His glasses were changed four times in the next nine years, and the nuclear haze grew denser.

In 1918, he required:

R. −10.⊂−4. cy. ax. 105° V.=0.25

L.−10⊂−4. cy. ax. 85° V.=0.4

With 4.5 diopter weaker sphericals, he continued to read until the close of his life, two or three years later.

Case 90. Mrs. T. D. E., aged 69, was first seen in 1911. Her right lens was clear, her left showed a diffuse cloud of small dots in the posterior

cortex, and some fine opacities in the vitreous, Correction:

R. +2.25⌒−0.37 cy. ax. 175° V.=0.9

L. +2 spherical, V.=0.6

In 1915, December, she had a large retinal hemorrhage in the left eye, some in the macula, and was put on pilocarpin locally, altho tension seemed normal to fingers. There were a few posterior synechiae. Tension rose to 60 mm., but quickly came down to 25 mm. under pilocarpin and hot stupes. In 1916, September, the tension was R. and L. 20 mm. (Gradle tonometer.)

1918. The lens was more clouded in L. and vision reduced to 0.01. R. now showed cortical haze and striae, chiefly in the periphery. In L. the general haze had cleared and there remained dense cortical opacity in the lower nasal quadrant running to center of pupil and cortical striae in other directions. She showed marked retinal angiosclerosis.

1921. Lens. R. +1.87 sph.=V. 1.1. L. V.=0.01 not improved.

There is in psychology a justification of such a collection of commonplace cases as has been offered in this paper. Strong impressions are the more lasting and influential. The cataract case which comes to operation, or does well under a new method of treatment in which one is strongly interested, is remembered longer and dominates one's thinking more than many cases that run the common course. Unless we occasionally make studies like this, statistical or of the general average cases, our prognoses and our judgment as to methods of treatment will be warped and vitiated by the stronger impressions made by the exceptional cases.

The practical importance of this has been well put by a recent writer (Wells, *Boston Medical and Surgical Journal* Dec. 1915): "Unless one can show that his results with a certain drug, internal or external, or the indicated remedy, or mechanical appliance are better than the untreated case, he has not proved the therapeutic value of his interference. Patients are so willing to be treated, especially if one uses the word cataract, that it takes some moral courage to resist."

PERIOSTITIS OF ORBIT.*

ROBERT MERRIAM ROGERS, M.D.

BROOKLYN, N. Y.

In this case repeated attacks of eye inflammation had occurred, one of them four days after cataract extraction. The response to the Wassermann test became negative only after prolonged, very active antisyphilitic treatment. Read before the Brooklyn Ophthalmological Society, Feb. 21, 1924.

I. C., male, 60 years old, married, butcher, Russian.

Personal and venereal history negative, except for periostitis of the tibia, that was operated on at the Long Island College Hospital 9 years ago. This was regarded as specific, but a negative Wassermann reaction was secured at that time.

In June, 1922, he was operated on by the writer for senile cataract of the left eye, which was unattended by any complication and an uneventful recovery was expected. Suddenly, on the fourth day after operation, a severe infection of the uveal tract occurred, of such a character that removal of the eye was contemplated. A 4 plus Wassermann report was secured, and in 30 days the inflammation subsided after 6 intravenous doses of salvarsan, daily mercury rubbings and iodid of potash internally. During the fall of 1922 the eye remained quiet and he had a course of intramuscular mercury injections, with iodid of potash, at the end of which time the Wassermann report was still 4 plus.

Jan. 6, 1923, he developed a deep boring pain in left side of head and looked and felt sick. Physical examination was negative for any cause.

*From the Department of Ophthalmology of The Long Island College Hospital, Brooklyn, N. Y.

Seven days later the left eyeball began to bulge directly forward, without any signs of inflammation. As his headache and proptosis continued, he was admitted to the eye service at Long Island College Hospital.

X-ray of the head showed a thickening of the orbital walls, "which occurs in the 3rd stage of syphilis and is progressive".[1] While the sinuses were negative, the ethmoids and sphenoids were cleaned out to the orbital plate and no pathology was found.

He was given daily rubbing of mercury and increasing doses of iodid of potash, so that at the end of 13 days he was taking 144 grains per day (Jan. 26).

On Feb. 3rd (21st day), after consultation with Dr. H. Morton of the Department of Genitourinary Diseases, the iodid was increased 10 grains per day.

Despite this treatment, the proptosis progressed until Feb. 9th (27th day) date of photo (Fig. 1) when he was taking 240 grains of iodid per day.

The photograph is not to be interpreted as lid swelling, but as a definite forward protrusion of the eyeball for 25 mm. The eyeball was firmly fixed, showed chemosis of the conjunctiva and the upper eyelid was congested, due to venous stasis.

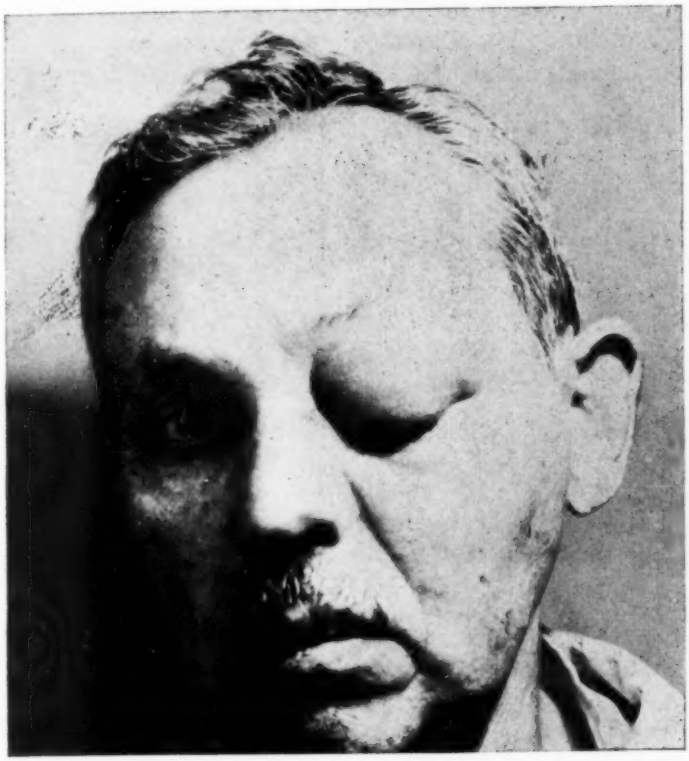

Fig. 1.—Periostitis of orbit; 27th day of proptosis, 25 mm. protrusion.

At this time a slight improvement was noted in the proptosis, but he developed an abscess of the lacrimal gland, which required incision on Feb. 19th (37th day), at which time he was taking 420 grains of iodid per day. This abscess had nothing to do with his primary condition. Culture from the pus showed a pure culture of staphylococcus aureus. Mercury rubbings were stopped on March 1st as his teeth were getting sore.

On March 10th (56th day) he was still taking 420 grains of K. I. and the photographs (Fig. 2) show less than 5 mm. of proptosis, due to "permanent

deposit of bone, which is common in syphilitic periostitis[2]".

This dose of K. I. was continued until Apr. 4th, 1923, when he developed symptoms of acute iodism; headache, difficulty in swallowing, gum infection, gastric disturbance, and delirium. He was secured in Dec., 1923, and it has remained negative since.

The absence of inflammatory signs, normal white cell count, lack of elevation of temperature, with its chronicity, excluded an acute infectious process.

During the period of treatment for

Fig. 2.—Periostitis of orbit; 56th day of proptosis, 5 mm. projection.

was in the hospital 13 days with blood Wassermann still 4 plus, but spinal fluid negative.

Since then he has had several courses of mercury injections, has smoked mercury in a pipe, and with more iodid of potash a negative blood Wassermann the proptosis, in 56 days he had 42 rubbings and over 33 ounces of K. I.

During the entire period to his acute iodism he had taken a total of 68 ounces of K. I.

1. Fuchs. 6th Edition Text Book of Ophthalmology, p. 809.
2. Fuchs. 6th Edition Text Book of Ophthalmology, p. 808.

COLORS AND COLOR VISION.

H. G. Merrill, M.D. and L. Weston Oaks, M.D.

PROVO, UTAH.

This is a brief presentation of theories of color vision as based on four primary colors, red, yellow, green and blue. The way in which these may be associated to give other color effects is illustrated by diagrams. Read before the Utah Ophthalmological Society, May 19th, 1924.

It is fairly well accepted now that there are four primary or chromatic colors, instead of three, as we were taught in our school days. The fourth, green, was thought to be a combination of yellow and blue. It is now known that while the refracted rays from yellow crystals and blue crystals—in paint—give an effect of green, these crystals are not actually blended. When one takes blue and yellow paper discs in proper ratio and spins them rapidly

on an electric motor so that blending is perfect, the effect is gray and not green. The four primary colors, therefore, are yellow, blue, red and green.

The yellow is complementary to the blue, as is the red complementary to the green. Colors which are complementary are also known as antagonistic; and under proper conditions, any of them will induce a negative after image of its complementary color. For instance, given a neutral gray background, one may look intently at a small red object, conveniently a square colored paper, for a few moments; then have it suddenly removed and the spot formerly covered by the red paper will appear green. In like manner, green will induce a negative after image of red; yellow induces blue, and white or black will each induce the other. Furthermore, any two complementary colors, mixed in proper proportions and rapidly turned before the eye will produce gray. We have already said in support of green being one of the chromata that yellow and blue thus mixed produces gray and not green.

In the accompanying diagram, we have arranged the four chromatic colors in the form of a square, red, yellow, green, blue. By combining these four colors in different proportions, about 160 intermediary colors such as orange may be produced. Thru the center of the square, we have drawn a line W. B. which represents the degree of brightness, one end white and the other approaching black. When white is added to the chromata, or colors resultant from combinations of them, the brightness is increased, the saturation is diminished, and we have a tint of the color used. If black is added to any of the 160 colors derived from the four chromata, the brightness is diminished, the saturation is decreased, and a shade of the color is obtained. Brown is a shade of orange. It is possible, by adding gray, to decrease the saturation without affecting the brightness of a color.

Along the axis line of brightness W. B., some 660 distinguishable variations occur. If now the diagram is made to represent a double solid pyramid, it will include all of the distinguishable colors known to exist. There are some 40,000 in the whole color manifold.

As ophthalmologists, we know that the retinal substances activated when

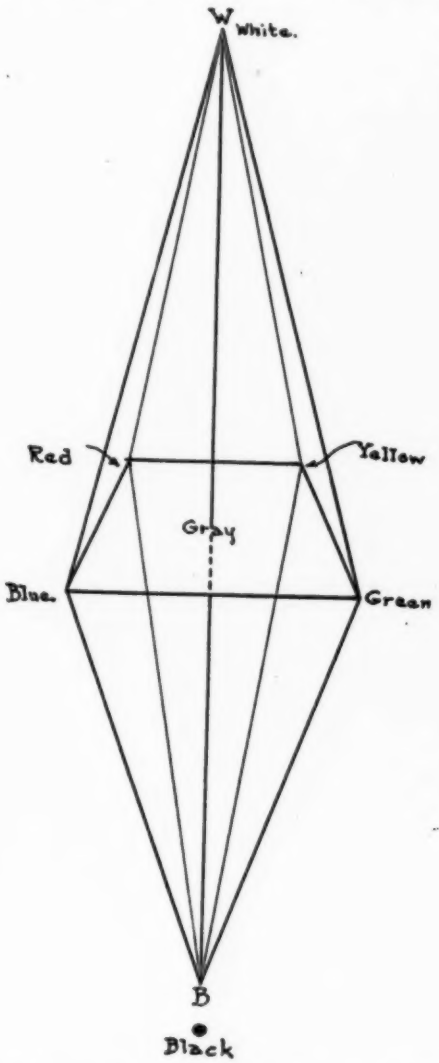

Fig. 1.—Diagram illustrating relations of primary and secondary colors.

we are seeing the chromatic colors and their combinations, reside in the cones of the retina, and are distributed in and near the macular region; the red and green color substance being nearer the center than the yellow and blue. Every time we take the color fields this fact is brought freshly to mind. The line

of brightness shown in the accompaning diagram represents the light sense, both as to light minimum and light difference. Just as chromata perception is represented near the macula in the cones, so the sense for brightness or light sense resides in the rods, and is principally in the periphery of the retina. We sometimes allude to this as twilight vision, and it suffers with any pathology in the equatorial region, notably retinitis pigmentosa.

The negative after image, already alluded to as being induced under given conditions, is quite a different matter from a positive after image which is a mental hang over of the object seen. Try turning on a bright light for just a moment after the eyes have become dark adapted. There will be a latent period or interval of darkness followed by a reappearance of the light as seen originally. If it ends at that, you have produced a positive after image referred to as a hang over. Should the light used with the dark adapted eye be brighter, or if its action be more prolonged, then following the latent period and positive after image you will experience what is known as the flight of colors; which cannot be predetermined, but which will be a series of brilliantly colored lights. No color theory attempts to explain this flight of colors, except to say that the photochemical substances in the retina have been so physiologically upset by the brilliance of the stimulus that the sequence of colors cannot be predetermined.

A negative after image is always the complementary color of the stimulus. We have called the positive after image a mental hang over, and in the production of it, the brighter the stimulus the shorter will be the latent period, and the brighter and more persistent will be the positive after image. This varies much with the sensitiveness of the individual retina, some people experiencing considerable annoyance from these images especially on turning off electric lights at night.

The color theory most widely accepted and taught in our schools is that of Helmholtz, sometimes spoken of as the Young-Helmholtz theory. This seems to explain perfectly the physics of color, altho it fails in many instances to agree with known phenomena in the psychology of colors. In it, three photochemical substances are presumed to reside in the retina. They are red, green, and violet. The red effect is produced by the long ethereal waves, the violet by short waves and the green results from the intermediary wave lengths. The spectrum is well explained by this theory, but the negative after image is not so explained, and the explanation of color blindness seems not to be satisfactory. For instance, people are most frequently color blind for red and green, and if one adheres to the Helmholtz theory, one must, in these cases, admit the absence of all photochemical retinal substances except that for violet. This one substance remaining would not explain the ability of the people who are red-green blind in dealing with other colors.

The Hering color theory, on the other hand, explains perfectly many psychologic color phenomena concerning which the Helmholtz theory fails. It presumes the presence in the retina of three photochemical substances; (a) the red-green substance located nearest the macula, (b) the yellow-blue substance distributed somewhat farther out, and (c) the white-black substance reaching well into the periphery. When the stimulus of ethereal waves is such as to produce a breaking down, or katabolic change, in the red-green photochemical substance, then the effect is that of red. When an anabolic, or building up, process is under way with this same photochemical substance, the resultant interpretation is that of green. In the same way, katabolism of the yellow-blue substance produces yellow, anabolism, blue, and with the third, or white-black substance, the same processes will produce similar results. It will be noted that the three colors produced by the anabolic or upbuilding process, green, blue and black, are the ones classified as the restful colors, while the ones which result from katabolism, red, yellow and white,

are quite the opposite. Note how nicely this theory of Hering explains the negative after image. If one looks at red on a neutral background until the katabolic change in the red-green photochemical substance is far advanced, then to restore equilibrium the anabolic change begins as soon as the exciting stimulus is removed, and the after image green replaces the exciting color red. The same process is carried out with the complementary colors yellow and blue; also with white and black. If the Hering theory is not the proper explanation, then we must search further, as the Young-Helmholtz theory commonly taught will not suffice. The Ladd-Franklin color hypothesis, which we will not discuss here, seems to us to have no advantages over the theories mentioned.

If Hering's idea be accepted as a working basis, we have an explanation for the well known fact that the four chromatic colors are the only ones which may be seen as such over the whole color field. For example, while red is perceived as brightness in the periphery of the form field, it is seen as red over all of its color field, and not at any time does it resemble another color. On the other hand, violet being brought in from the periphery is first seen as blue and later as violet. The distribution of yellow-blue photochemical substance in a wider area than the red-green substance explains this satisfactorily.

In dealing with the color blind, we find another piece of evidence supporting the Hering theory. People who are color weak, or color blind for red are also color weak or color blind for green; the presumption being that the red-green photochemical substance spoken of by Hering is diminished or congenitally absent. However, there seems to be a lack of support in the fact that the cases who are blind for yellow and blue, altho these are rare, are also blind for red and green. In other words, they are the totally color blind. If Hering were correct, one would expect to find people with an absence of the yellow-blue photochemical substance in whom the red-green substance functioned normally.

The ability to perceive color varies greatly with the individual. There are all grades of color perception from the supracolor perception of the artist to the normal—and all grades of color weakness down to actual color blindness. In determining color weakness the Nagel cards are desirable. They are inexpensive and more accurate than Holmgren's skeins of yarn or other commonly used methods. (C. H. Stoelting Company of Chicago carries them in stock.)

The background and the immediate surroundings of a color exert a decided influence in the judgment of its quality. For this and other reasons a neutral gray is being more and more used in eye examining rooms and is replacing black walls and ceilings of dark rooms with many ophthalmologists. That, however, brings up one of the many phases of color work purposely not brought within the scope of this preliminary discussion.

NOTES, CASES, INSTRUMENTS

COLOBOMA OF THE OPTIC NERVE.

J. E. JENNINGS, M. D.,
ST. LOUIS.

Mrs. W. M., aged 48, consulted me March 28, 1924, to have her eyes examined for reading glasses. She stated that the vision of the right eye was very defective.

Vision: O. D. 6—100; with —0.75 sph. 6—60. O. S. 6—7.5; with —0.37 cyl. ax. 165 6—6.

The fundus of the left eye is normal.

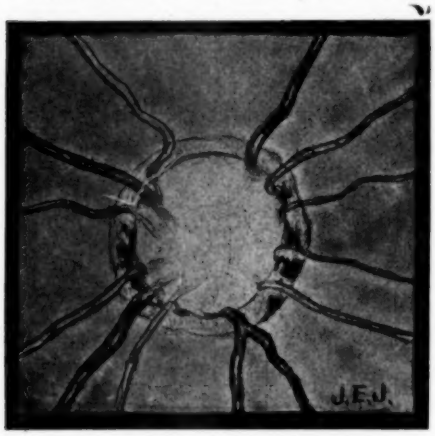

Fig. 1.—Coloboma of optic nerve.

The site of the optic disc of the right eye is occupied by a grayish white funnel shaped cavity about three times the diameter of the normal disc. The rim of the cavity is covered at places with masses of black pigment. The retinal vessels on the nasal side disappear abruptly at the edge, while those on the temporal side can be followed some distance down into the cavity, when they are lost to view. The field of vision is normal except that the blind spot extends from the fixation point outwards 20 degrees.

MEDIAL CONGENITAL ANKYLOBLEPHARON. CONGENITAL ABSENCE OF CARUNCLES.

E. H. OPPENHEIMER, M. D.,
NEW YORK CITY.

Mrs. N., Spanish, aged 66, was referred to the Eye Department of the Lenox Hill Hospital, June 14th, 1924. She had been treated in the Skin Department of the Hospital, for sores of the mouth, presumably pemphigus due to plates and dating back seven years.

The patient complained that the left eye occasionally become red; very little tearing, no actual pain. As a child her eyes were sometimes red, but never seriously affected. She had never been ill; four normal children. She used glasses.

Examination showed a small woman of rather cachectic appearance. Vision, fundus, motility normal. Local inflammation of left bulbar conjunctiva due to the presence of two delicate inverted misplaced lashes of the lower lid, a condition sometimes met with in old and debilitated patients. Aside from this slight irritation both eyes appeared perfectly normal.

The palpebral condition is normal without follicles or scars. Eversion of both upper and lower lids, however, reveals a slight symblepharon, a fold which reaches nasally to both borders of the lids. The plica semilunaris and the caruncle are missing on both sides; and a web like bridge of true skin extends from one canaliculus to the other above where the lacus lacrimalis and caruncle ought to be. If stretched, this bridge or membrane appears thinner, paler and more transparent in the middle part so that, were there a caruncle beneath, it would be visible thru it. No scar whatever can be seen. The puncta are smaller than usual and hard to detect. They are properly located and the canaliculi patent, but extremely narrowed. Cannot syringe thru to the nose.

Upon closer inspection the eyes look strange, evidently due to the fact that the angle of the lids is circular (see sketch 2) or nearly so (sketch 1).

Diagnosis. That neither traumatism nor inflammation or other disease is the cause is proved by the lateral occurrence and the symmetry, the absence of scars, the lack of semilunar folds, the missing caruncles, and also the history. Trachoma is out of the question. It therefore is a congenital malformation.

Remarks. Similar cases are not, so far as I could find out, on record. I have never seen one in my private practice. In 1908 I reported a rare case of ankyloblepharon filiforme adnatum (Arch. f. Augenh., v. 61). Only five other cases had hitherto been published.

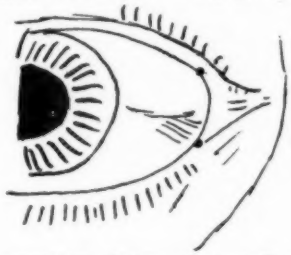

Fig. 1.—Congenital absence of caruncle, right eye.

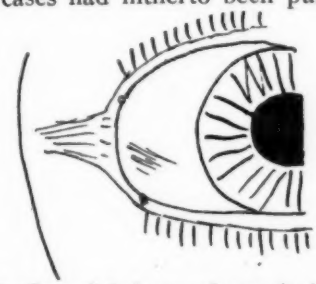

Fig. 2.—Congenital absence of caruncle, left eye.

At that time I concluded: "I venture to state that anomalies of this kind probably occur oftener than it seems, for many colleagues have not the time, nor do they trouble to report on all curious cases they meet with in their private practice, provided they present only casuistically interesting features."

Perhaps some of my readers may know of similar cases from their records.

A NEW LID ELEVATOR.

A. S. GREEN, M. D.,
L. D. GREEN, M. D.,
SAN FRANCISCO, CALIF.

There are three distinct methods for controlling the lids during a cataract operation; first a speculum of some kind, second a hook, and third the fingers. The object of each method is to properly expose the field of operation and to control the lids. The degree of safety with which this is done varies with the method used. The speculum, while giving the largest and most accessible field, is the most dangerous, because the blade may act as a fulcrum, and if the patient squeezes, it may cause a great loss of vitreous. To avoid this some operators dispense with the speculum entirely and use the thumb or fingers to retract the lids. This method is undoubtedly safer than with the average speculum but is sadly deficient in certain types, the squeezers and patients with prominent eyes.

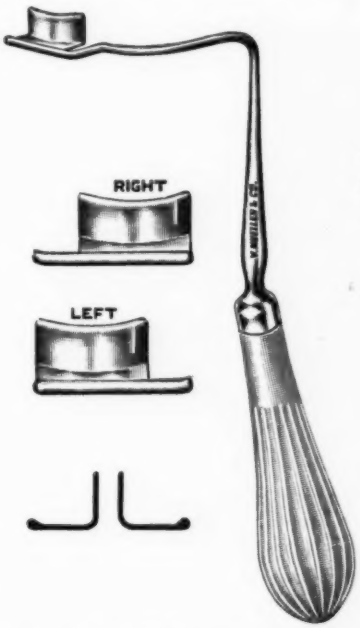

Fig. 1.—Green's new lid elevator. Complete instrument right and left blades front and below in section.

Undoubtedly the safest method for these and all other cases is the lid hook as advocated and used by Col. Henry Smith. With a hook one may frequently cause the cornea to drop towards the lens after the section, demonstrating the negative pressure; whereas a speculum, by resting on the globe, causes a positive pressure and thus increases the liability to loss of vitreous. The lid hook has a serious disadvantage in that it greatly interferes with the manipulation of the operator and does not give an adequate operative field.

For about eight years the writers have used an instrument that embodied

the good exposure obtained from the speculum minus its greatest danger, the fulcrum action. The great disadvantage with it was, that at times one

Fig. 2.—Method of using lid elevator. Handle grasped by hand that draws down lower lid.

encountered a little difficulty in removing it from the eye of a bad squeezer. We have, therefore, eliminated the lower blade of the speculum and in its place employ the thumb to retract the lower lid, as shown in the photograph.

Method of Use: The eye and lids are prepared with novocain at least three-quarters of an hour before the operation begins. There is an elevator for each side, held in the right hand of the assistant when operating upon the left eye and in the left hand when operating upon the right eye. The assistant stands at the right side of the patient if the left eye is to be operated upon and at the left side if operating upon the right eye.

The handle of the instrument is firmly held between the palm of the hand and the forefinger. The blade of the elevator is inserted under the upper lid, the thumb of the same hand is placed on the lower lid and retracts it, acting as the lower blade of a speculum. The position of the blade in its relation to the eye is altered, by simple wrist motion, to accommodate the steps in the operation. The extensor surfaces of the middle phalanges rest firmly against the patient's cheek and thus serves to steady the hand. The other hand is left free to steady the brow, clean the culdesac or give any other assistance that the operator may require. After completion of the operation the thumb of the assistant's free hand is placed upon the upper lid, maintaining its position on the blade, while the entire lid is lifted over the cornea and the blade gently removed and the eye closed.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly scientific papers and discussions, include date of the meeting and should be signed by the Reporter or Secretary. Complete papers should not be included in such reports; but should be promptly sent to the Editor as read before the Society.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Section on Ophthalmology.

APRIL 17, 1924.

DR. T. B. HOLLOWAY, Chairman.

Congenital Palsy of External Recti.

DR. H. MAXWELL LANGDON exhibited a boy, aged 10 years, who had convergence of his visual axes with inability to rotate the eyes outward from birth. The boy is healthy in all other respects. The visual fields and pupillary reactions are normal. Ocular rotations are full and equal in all directions with the exception of the palsy of the external recti. These cases are at times due to faulty insertion of the muscle or to absence of the muscle rather than a lesion of the nervous system. In the present case the cause of the condition is not known, as no operative procedures have been attempted.

Cases of Irideremia.

DR. LANGDON also exhibited two cases of irideremia—Mrs. J. T., aged 32 years, and her brother, A. J., aged 26 years. The former had almost complete irideremia. The brother had no external signs of the presence of any iris tissue. The mother had the same condition, as did the grandfather, the great-grandmother and the great-great-grandmother. The man has a corrected vision of 5/10 in each eye, the media are clear, the fundus apparently normal, and in the right eye the suspensory ligament of the lens is seen down and in. The sister has corneal scars from former ulcerations, with some lenticular haze. Vision, right eye, 5/60, left eye, hand motions at one foot. A poor view of either fundus was obtained. Tension, right eye with the Schiötz tonometer, 38 Hg. mm.; left eye 58 Hg. mm. It was impossible to use a myotic or to attempt iridectomy. An Elliot trephining operation was performed. The conjunctival flap was separated without trouble but the sclera was found to be rather spongy instead of the fibrous normal tissue, and, while attempting to split the limbus, a sudden gap in the sclera appeared to the outer side of the area which was being separated, thru which fluid vitreous immediately oozed. As this was immediately back of the limbus, the opening was over what would have been the posterior chamber had iris been present, and it seemed possible that the fact that vitreous came thru so freely explained the increased tension, making it probable that there was vitreous in the anterior chamber as well, which on account of its increased viscosity could not be filtered in a normal way. Mr. Treacher Collins has reported cases of apparent irideremia in which a root of the iris was found which blocked the angle, and this may be the condition in the present case; tho it seems that the condition of the vitreous is quite sufficient to account for the condition.

Discussion. DR. WM. ZENTMAYER said that a few years ago he showed before the Section, a child, mother and grandmother, all with unilateral congenital palsy of the external rectus.

DR. WM. CAMBELL POSEY stated that, apropos of glaucoma in aniridia, he recalled the classic case of Treacher Collins of glaucoma with aniridia, in which no trace of the iris could be found clinically. But after the removal of the eye the microscope showed the root to be present and adherent to the cornea, blocking the angle of the anterior chamber. He thought it was now generally accepted that in all cases of congenital aniridia with glaucoma, similar rudiments of the iris were present.

DR. T. B. HOLLOWAY stated that in the cases of aniridia, heredity was a conspicuous factor. He alluded to the most unusual instance of this kind that was recorded before this Section by the late Dr. Risley. In a case that he per-

sonally had placed on record before this Section, it was impossible to determine definitely any hereditary taint, and in another case now under observation it was impossible to elicit any definite information in regard to this. He felt, as Dr. Posey has stated, that even where clinically the iris appears to be wholly deficient, there is usually a stump remaining with certain pathologic changes at the angle that gives rise to the glaucoma, which not infrequently is present and which was evident in the case he reported before the Section.

Pathogenesis of Vossius Ring Cataract.

Dr. Wm. Zentmayer read the paper published in full in this Journal for September, p. 676.

Discussion. Dr. T. B. Holloway said that, as is well known, this type of cataract is not only caused by contusions to the anterior part of the eye, but that penetrating injuries posterior to the lens are also followed by similar manifestations. He stated that at a recent meeting he had referred to his studies of a case by means of the corneal microscope with slit lamp illumination, in which the observations of Hesse were confirmed. He thought the case history cited by Dr. Zentmayer was particularly interesting and unique; and it seemed to have a definite bearing on some of the more recent views in regard to the etiology of this type of cataract.

Antimetropia.

Dr. Warren S. Reese exhibited a case of antimetropia. Under homatropin, the patient took the following: R. E. sph. −1.75=6/9+; L. E. sph. +1.75=6/6. At postcycloplegic examination, it was necessary to add spherical −1.25 to the cycloplegic findings for each eye, to secure the vision obtained under cycloplegia. In the right eye there was apparently a latent hyperopia in a myopic eye, and of the same degree as the latent hyperopia in the hyperopic eye. Probably the myopic eye was accommodating synergically with the hyperopic eye, since there was slightly better vision in the latter eye.

Oculomotor Palsy With Unusual Manifestations.

Dr. Reese also exhibited a case of oculomotor palsy in whcih all the extrinsic muscles were involved, except the left externus and left superior oblique. The preservation of this latter muscle was shown when the patient attempted to look down, whereupon the affected eye rotated markedly in a counter-clockwise manner. There was also iridoplegia and cycloplegia. The unusual features of the case were (1) on looking to the left, the ptosis became much more marked; (2) on looking down, the affected upper lid moved up; (3) on attempting to look up, the left eye turned in; even better than when the patient attempted to look to the extreme right.

Discussion. Dr. Wm. Zentmayer inquired, in the case of oculomotor palsy, if there was a history of migrain? If so, with the history of recurrence of the palsy, it would suggest the case to be one of ophthalmic migrain.

Associated Contralateral Eye-Ear Movement.

Dr. Reese exhibited a case of associated contralateral eye-ear movement. On the extreme lateral rotation of the eyes to the left, the right ear moved in. This also occurred on extreme lateral rotation to the right, tho to a much less degree. The same movement of the left ear occurred on extreme lateral rotation to the right. The patient was unable to move his ears voluntarily and had not been conscious of this peculiar associated movement until his attention was called to it.

Dr. Edwin B. Miller stated that the case of oculomotor palsy was seen by him two months previously at the Polyclinic Hospital. At that time he was suffering from severe headache associated with complete third nerve paralysis of the left eye—ptosis, eye was deviated down and out, and, on attempted downward rotation, distinct intorsion from action of the superior oblique. The pupil was dilated and fixed. The lifting of the left lid with downward rotation of the eye was not

noted at the first examination. Neurologic report negative, as well as all laboratory tests. In a few days the headache subsided and the eyelid returned to normal. The patient stated that in the last two years he had had several similar attacks. A diagnosis of ophthalmic migrain was made. At the present time there is a partial recovery of the third nerve palsy with improvement of the ptosis.

Discussion. Dr. Wm. Campbell Posey asked if the muscle balance had been studied. Some years ago in tabulating a number of cases of anisometropia, he was surprised to find that altho conditions obtained in this class of cases which would favor muscle imbalance, i.e., difference in the length of the eyes, frequent dissimilar insertion of extraocular muscles into the globe, orbits of different shapes, etc., the muscle balance was in nearly all the cases practically normal.

Discussion. Dr. Zentmayer said that the case of ear-wagging belonged to an interesting group, exhibiting many combinations of which perhaps the jaw-winking type is the most common. Other variations are spasm of the orbicularis during mastication, a case of which was reported by Harlan; paralysis of accommodation during mastication; contraction of the frontalis associated with abduction; contraction of the levator associated with abduction or adduction, and retraction of the globe either in abduction or adduction. It has been suggested that some of these cases are atavistic, as in certain of the lower animals, groups of muscles which in the human have separate innervation, are all innervated from the same center, the supposition being that in these cases there has been a failure of differentiation of muscles. Harman states that 20 per cent of all individuals show that elevation of the alae of the nose accompanies normal blinking.

Dr. Langdon said that Mr. N. Bishop Harman of London, for many years connected with the anatomic department of Cambridge University, wrote some years ago a very interesting article which was published in the Transactions of the British Ophthalmological Society on comparative anatomy as an explanation for some of these movements.

Dr. Holloway stated that a number of years ago he had placed on record before this Section, the history of a case of jaw-winking. At that time he cited the various theories of Sinclair, Gunn and others, and certain of these observers had alluded to just the type of case that Dr. Reese had shown, i.e., the association of ear movements with the rotations of the globes. It was interesting to note that in the case under discussion, when the eyes were rotated to the left the right ear retracted. From certain viewpoints, one might expect the ear to be turned in the same direction as the eyes.

Unusual Hole In the Fundus.

Dr. Hunter W. Scarlett exhibited a young woman who showed an unusual hole in the fundus. The patient, Miss C., came for examination for glasses. On routine examination a large circular hole was seen in the right fundus down and out from the disc about one and one half disc diameters. The depth of this hole amounted to about 3 or 4 diopters. It was surrounded at the inferior border by a small amount of pigment. The bottom of the hole was stippled with brownish pigment, while coursing along its side, about half way down, was a choroidal vessel. A small patch of choroiditis was situated to the temporal side of this hole. Vision, 20/30, corrected to 20/20. No history of injury, inflammation or general illness could be elicited. The probable cause was a localized choroiditis.

Optics as Applied to Ophthalmology.

Dr. Alfred Cowan said that in 1921 there was begun in the Graduate School of Medicine of the University of Pennsylvania a regular systematic course in optics. There was no attempt to cover the whole field of optics, but rather to carry out the plan of Landolt and explain those facts which are considered indispensable to an ophthalmologist. As far as was known, there was no precedent for a year's course of this kind, and, for this reason, no book could be found that adequately covered the subject. For

the first part the works of Clay, Glazebrook, Ganot, Carhart, Prentice, Southall, Heath, and for the later part, Young, Helmholtz, Donders, Landolt, Tscherning, Duane and others were freely used and modified.

The apparatus is simple, the most important of which is an optical bench and the necessary equipment. All the apparatus is given out at the beginning of the course. The men work in pairs, two pairs at one large table, on each side of which is an electric outlet and two lockers.

Each experiment is explained by models and specially drawn charts, and performed with the same kind of apparatus that is used by the student. From the result of the experiment is deduced the theoretic consequences. Their applications to ophthalmologic instruments and to the eye are kept constantly in the mind of the student. The formulae are mostly the same as are used later, since uniform notations are employed thruout the course. Every effort is made to simplify the subject, and no man need be a mathematician; but some knowledge of mathematics is absolutely necessary in the study of optics.

In the beginning is studied the nature of light, luminous and nonluminous bodies, media, shadows, intensity of light and photometry. Simple experiments with pins are done to prove the laws of reflection and refraction at plane surfaces, first one, then two, parallel and inclined at an angle. This brings prisms and their numeration to the consideration of the student. Much detail is gone into at this stage of the course, so that the principles that underlie the whole subject of optics may be thoroly understood.

Experiments are performed on the optical bench to prove the formulae for principal and conjugate focal distance and the size and shape of the image for mirrors, and the various forms of lenses, and combinations of lenses, with and without a separation.

Next is studied the Gauss theory of refraction at a single refracting surface (always with the cornea in mind), then lenses of finite thickness such as the crystalline, ordinary ophthalmic lenses, and the newer forms of lenses. Up to this time the student has been working in reciprocals, so that the dioptric system needs hardly an explanation.

Practical exercises are given in the neutralization of lenses, the use of the protractor, and the centering and decentering of lenses as is done in an optical shop.

As has been said, all considerations have lead to the point where could be intelligently studied both the physical and physiologic optics of an eye as an optical instrument; first, the static and dynamic emmetropic eye, then ametropia, and finally the combination of the eye and a lens. And lastly, are rehearsed the optical principles of such instruments as are necessary in the daily work of an ophthalmologist, including the ophthalmometer and ophthalmometry, the ophthalmoscope and ophthalmoscopy, the retinoscope and retinoscopy, and the usual trial case accessories.

Discussion. Dr. T. B. Holloway congratulated Dr. Cowan upon the efficiency of the course he had elaborated, and commented upon the difficulties in making such a course practical as well as interesting. He felt that Dr. Cowan had succeeded in both of these.

C. E. G. Shannon, Clerk.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

March 17, 1924.

J. Brown Loring, President.

Bilateral Microcornea, With Persistent Capsulopupillary Membrane.

Dr. H. P. Davidson (by invitation) presented the case of a Polish Jew, male, age 22, who came to Dr. Wilder's clinic in January, complaining of swelling in the right upper eyelid. Examination revealed vision R. 20/50; L. 20/200. Eyes were well spaced, forehead broad, lids negative except for chalazion, 3 mm. in diameter, in the outer third of the right upper lid. Conjunctiva and sclera negative, cornea small, rather oval, the right being 9x 8¾ mm., the left 9x8½ mm. Pupils

equal in size, reacting well to light and accommodation.

In the right pupil were two membranes at eight and ten o'clock, extending from the lesser circle of the iris to a grayish diaphanous membrane, about 1½ mm. in diameter, at the center of the pupil, this membrane apparently being attached to the anterior capsule of the lens. In the left pupil, at five and seven o'clock, were much thicker membranes containing five strands each, and at eleven o'clock one thin membrane, which had an origin and insertion similar to those seen in the right eye. The thin membrane on the left lens capsule was 2½ mm. in diameter. Iris in. each eye otherwise normal, and could be dilated evenly with homatropin and cocain, under which the strands of the membrane, which had been curled, were seen to straighten out.

Family history revealed that the father (deceased) had had small eyes, and one sister, living in Chicago but not examined, had the same condition. Homatropin refraction revealed compound hyperopic astigmatism R. E., and compound mixed astigmatism L. E., bringing both eyes to 20/50. With correction patient read 0.75 m. right and left, and was able to work every day at an addressing machine without fatigue.

Dr. Davidson called attention to the fact that Franke had reported that in examining 3,508 persons, 32, or 0.9 per cent, showed this condition, 14 of whom had membrane on capsule of lens, only three of these being bilateral. Stephenson reported that in examining 3,414 persons, 68, or 1.7 per cent, showed this condition, with thirteen bilateral capsulomembranes.

The condition is not altogether rare, and Dr. Davidson believed that with the aid of the slit lamp many more cases than before would be recognized.

Dislocated Lens.

DR. EARL FOWLER presented four cases, two children from each of two families, with congenital dislocation of the lens; three upward and inward, and the fourth so extensive, that when the pupil was dilated the lens came forward into the anterior chamber. In all four cases, vision was very low, being no better than 20/100 in any one of the eyes. Correction with lenses was very unsatisfactory, in fact, the patients objected to wearing them. Two of the children were in school and progressing well in spite of the handicap.

Discussion. DR. SOL ROSENBLATT said he recently had had a family under his care, in which the mother and two children had both lenses dislocated.

Intraocular Paralyses.

DR. THOMAS D. ALLEN presented four cases. The first, a young man of 25 years of age, came to Rush Medical Dispensary in June, 1922, two days after a severe burn of the left eye and eyelid, caused by a gasoline explosion. Vision at that time was normal in the right eye, questionable light perception in the left eye. The left eye was removed about two weeks later. Marked contraction of the lids and conjunctiva occurred, with ectropion of the lower lid and entropion of the upper lid. Several operations, mainly Thiersch grafts, were done on the conjunctival sac and skin surface of the lower lid. Two large pedunculated grafts were taken from the left forehead, one with pedicle at the temporal side, and later one with pedicle at the bridge of the nose, and engrafted in the upper lid, each one extending to the opposite canthus. By this the eyelids were so improved that he could wear a prothesis, giving him a very presentable appearance. The last two mentioned operations had been done ten and seven months previously.

The second case, a boy of 12 years, was first seen in February, 1924. He had had a convergent squint since babyhood, had worn glasses off and on, and at present was wearing glasses which gave him a vision of 20/100 R. E. and 20/20 L. E. A diagnosis was made of (1) paralysis of convergence; (2) paralysis of superior recti, right and left; (3) convergent squint (old); (4) compound hyperopic astigmatism; (5) amblyopia ex anopsia. With his hyperopic correction he had an eso-

phoria of 8 degrees, varying at distance; at the near point he suppressed one image (R plus). On cover test, at 30 cm. with the red glass, a slight homonymous diplopia was occasionally demonstrated. Convergence was impossible nearer than 22 cm. from the eyes. The six field test of Duane showed paresis of both superior recti muscles; left hyperphoria, increasing with eyes turned up and right, and right hyperphoria, increasing with eyes turned up and left.

Case No. 3, a young woman, 20 years of age, had an old divergent squint and myopia, partial paralysis of the right internal rectus and spasm right and left inferior obliques, (left more than right). Vision corrected to 20/50 R. E., 20/30 L. E. Some weakness of accommodation present. Diplopia could not be elicited.

The fourth case, a girl 10 years old, showed complete paralysis of the left inferior oblique, and partial paralysis of the right inferior oblique, with amblyopia ex anopsia. She had had a concomitant convergent squint from birth. History showed that the mother had fallen about three months before the child was born; she had a hard labor and the child was delivered with instruments. There was a lump behind the left eye which disappeared at three or four days of age. Dr. Allen operated on this patient in August, 1921; a tenotomy of the left internal rectus was done, immediately following which the eye turned past the midline a few degrees. Further operation was postponed, both eyes were bandaged, the right for three days and the left for five days. A week later the left eye began to turn in again. In September, 1921, a Worth resection of the left external rectus was done, and the eye slightly overcorrected. Both eyes were bandaged five days. Immediate result excellent.

At present the eyes are perfectly straight and can be moved in all directions satisfactorily, except that the left eye cannot turn up and in at all, and the right eye cannot turn up and in normally. Diplopia is not elicitable. With glasses, vision is R. E. 20/15, L. E. 6/200. Media and fundi are normal.

Intraorbital Tumor.

DR. MICHAEL GOLDENBURG reported two cases. M. S., married, white, age 30, first came under observation in March, 1919, with history of right upper lid drooping for four years, so that she was unable to see. Examination disclosed ptosis of the right upper lid, eye slightly proptosed and displaced downward. On digital examination a movable mass about one-half inch in diameter was found, apparently attached to roof of orbit. Movements of eyeball were unimpaired. Blood Wassermann, differential count and urinalysis negative. At that time an incision was made thru the eyebrow extending into the orbit, disclosing a tumor mass that was encapsulated. During the operation the capsule was broken and a white cheesy substance presented. The tendon of the palpebral muscle was cut and sutured to the orbital ridge. Stitches were removed one week later and the ptosis did not seem to be marked. Laboratory report showed each vessel to be surrounded with epithelial cells, two or three layers deep. The patient had returned at intervals for observation. The ptosis seemed to be disappearing, and she could hold her lid up fairly well.

She again came under observation four years later, with complaint of eyelid completely ptosed and some pain in the region of the eye, which at times kept her awake. Examination disclosed findings similar to those previously enumerated, with R. V.=20/50, L. V. =20/20. She was again operated December 15, 1923. An incision was made thru the old scar and enlarged so as to permit free access to the deeper structures. Five or six small, rounded, bluish-gray nodules were removed, which were sent to the laboratory. The incision being broad, with some traction, the cavity lent itself favorably to both inspection and palpation. Skin sutures were removed in three days; recovery uneventful. After about three weeks there was no evidence of function of the elevator, but the patient was free from pain. Palpation disclosed a mass under roof of orbit, which was thought to be the

result of inflammatory reaction. Several weeks later the patient again complained of pain. The mass was still present, and as it was thought that the tumor was probably returning, she was subjected to a radium application of 50 mg. for twelve hours, with considerable benefit.

Case 2, white, age 7, first came under observation February 14, 1924. He had been blind in left eye since birth; no history, except that he could not see, and it was noted that the eye was somewhat larger. Examination disclosed left eye markedly proptosed forward; larger than the right eye. Cornea hazy and with the appearance of two small ciliary staphylomata, one at about ten o'clock and the other at about two o'clock, and another small ectasia at about six o'clock. Iris slightly dilated, and the pupillary area appeared a bright red, giving it an albino appearance. It was thought that free blood might be in the anterior chamber, but careful examination did not confirm this. Anterior chamber was shallow and the lens seemed pushed forward. Some conjunctival injection. The eye was hard, with tension to finger palpation about 3 plus. Tonometer could not be used owing to age of patient. Tentative diagnosis was made of intraocular tumor and enucleation was suggested. Operation was performed in the usual manner, and an attempt made to cut the optic nerve in such a manner as to have a long stem. On removing the eyeball, it was found that the optic nerve had been cut flush with the sclera. On sponging the cavity, a white body resembling a small white button mushroom was noted, which was exceedingly difficult to grasp with a forceps. Not being positive that this was optic nerve tissue, attempt was made to dissect around it and the optic nerve sheath was found to dissect away very readily. An attempt was then made to cut the optic nerve as far back as possible, which was accomplished with some degree of success. The boy made an uneventful recovery. The diagnosis given by the laboratory report was a healed glioma and possible small round cell sarcoma starting from the choroid. 50 mg. of radium was applied for a period of sixteen hours.

Discussion. DR. RICHARD GAMBLE said that section of the tumor in Case 1 showed a typical endothelioma composed of connective tissue stroma, with many dilated capillaries surrounded by several layers of endothelial cells, which spread out into the connective tissue in branching strands. There were also many large blood lakes. This section was similar to a section of the tumor removed four years ago, except that it was more vascular. This case showed the tendency of endothelioma to local recurrence rather than metastasis.

In Case 2, Dr. Gamble said the report was only preliminary, as just a small calotte had been examined so far. This section showed an intraocular tumor of malignant nature. The tumor cells in the choroid, where the nourishment is good, were viable and resembled small round celled sarcoma cells. There was no pigment. The cells in the vitreous cavity were completely necrotic. The optic nerve was completely infiltrated by these tumor cells, which had lost their round shape and become elongated. The nerve fibers were entirely destroyed. There was a possibility that this was a glioma which had almost undergone spontaneous cure by necrosis, the only living cells being those in the choroid and optic nerve. Further report would be made when the eyeball was sectioned.

Two Cases of Cyst of Iris.

DR. MICHAEL GOLDENBURG presented E. R., age 19, married, who came to the Infirmary January, 1924, with the following history: About eight years ago, he was struck in the right eye with an arrow, which apparently penetrated the cornea. He eventually made a good recovery, but a small growth appeared in the anterior chamber. Urinalysis, blood differential and blood Wassermann negative. About eight months ago the mass began to spread, and he complained of severe photophobia and profuse lacrimation. Vision R. E.=20/65; L. E.=20/20. Examina-

tion disclosed a diffuse corneal scar extending from about five to seven o'clock. A small bluish mass about 10 by 4 mm. was found in the anterior chamber, just back of the corneal scar. The lower border of the pupillary margin of the iris was distinctly horizontal.

Diagnosis: cyst of iris.

An attempt was made on January 22 to tap the cyst with a hypodermic needle. This was accomplished without much difficulty, and the fluid withdrawn was of a slightly turbid, yellowish character. Further attempt was made to destroy the cyst wall with a Ziegler knife. Two days after this procedure the pupil became round, photophobia and lacrimation ceased, and vision improved markedly. After about four weeks the cyst reappeared, and it was decided to remove the iris in the region containing the cyst. This was accomplished thru an incision at the limbus between 5 and 7 o'clock, with excellent result up to this time.

Case 2: M. V., age 47, married, colored, housewife, presented herself at the clinic January 21, 1924, with the following history: Injury to the right eye when very young; no trouble until a few months ago, when eye became red and painful, with marked aversion to bright light and constant tearing. Examination disclosed a bilobar cyst of the iris extending from about 10 to 2 o'clock, encroaching upon the pupillary margin and distorting the pupil. Between the two lobes of the cyst a distinct notch was present. Vision at that time: R. E.=20/100: L. E.=20/30. Urinalysis, blood differential, Wassermann and tension normal. In this case the cyst was tapped with a hypodermic needle and fluid similar to that found in the preceding case withdrawn. An attempt was made to destroy the cyst wall, with apparently good results, but about four weeks later all the symptoms returned and it was decided to perform a broad iridectomy to include the cyst. This was accomplished with little difficulty, and this time the patient was perfectly free of all symptoms.

Case of Glaucoma.

Dr. Michael Goldenburg. C. R., age 67, married, presented herself February 13, 1924, with the following history: Right eye very painful for some time past. Treated apparently by a general practitioner with no appreciable relief. Examination disclosed a congested, hard eye, with a hazy cornea, very shallow anterior chamber, with marked development of vessels on the iris; perception and projection negative. Ophthalmoscopic examination disclosed marked cupping of the disc. She was placed in the hospital for further observation. Urinalysis, Wassermann and blood differential tests negative. Tension by Schiötz was 50. Dr. Goldenburg was of the opinion that years ago this kind of eye would have been enucleated at once. However, an iridotasis was done with the hope that the symptoms would be relieved. Two days later the wound healed, anterior chamber refilled and the tension dropped to 20, with a relief of all symptoms; she was discharged from the hospital in about two weeks.

Discussion. Dr. George F. Suker asked Dr. Goldenburg why he split the sheath of the optic nerve to get it out.

Dr. Goldenburg replied that he was not sure he had the optic nerve, and tried to dissect around to judge it more carefully. It was found that the optic nerve sheath dissected away so easily that it was simpler to remove it. He had never seen that before. Incidentally, in this case he had given the child as high as 50 mg. of radium in sixteen hours, thru the courtesy of Dr. Brown.

Dr. V. A. Chapman, (Milwaukee, Wis.) asked Dr. Gamble what was indicated from the appearance of the piece of nerve removed. Dr. Gamble said this could not be decided. Four men had looked at the section and four different diagnoses had been made.

Dr. Earl B. Fowler was interested in the application of radium to destroy what tumor cells there were left, because it had been applied in one of his cases two years ago. The child was four months old. After the removal of a glioma, a little cylinder was used to protect the surrounding tissue and the radium put between the lids. There had been no recurrence, the child was

in splendid health, but there had been retraction of the tissue around the orbit and poor development in the bones of the face. He had seen one instance in which radium was used at a similar age, and no teeth developed in the four years following. This was not true in his experience with this child.

DR. HARRY GRADLE asked how long the child was under observation after the operation, and whether there was a greater lack of development than would be usual in a case of that age following enucleation of the eye.

DR. FOWLER replied that during the year and a half following operation he had watched the case carefully, and he could not judge whether the lack of development was entirely due to the enucleation or not.

DR. CHARLES G. DARLING spoke of a baby, two weeks old, which had evidences of glioma in both eyes. The mother had asked the doctor at the time of its birth if the child was blind, as she had a boy now eight years old who was blind in both eyes. The diagnosis of glioma in both eyes had been made by Dr. Beard. He advised enucleation of both eyes, which was refused. The baby, which apparently had glioma, died at the age of three weeks from some infantile infection, but in his opinion the case of the eight year old boy was one of glioma which had undergone spontaneous cure. The boy's eyeballs were both about as big as the end of one's little finger.

Recurrent Fibrosarcoma of Orbit.

DRS. GEORGE F. SUKER AND BUELAH CUSHMAN stated this case had been brought before the Society last year, and was being shown again because the patient had come back with a recurrence of the condition.

The patient came to the County Hospital at that time because of a mass in the right orbit which caused a proptosis, upon which an operation had been attempted elsewhere two weeks previously, but discontinued because of excessive hemorrhage. At the County Hospital, the mass was removed by Dr. Suker and found to be encapsulated, firm and easily dissected from the inner bony wall of the orbit. It extended well back to the optic foramen and did not seem to involve the nerve or sheath.

The report from the Cook County Hospital Laboratory, made October 13, 1922, was of a fibrosarcoma. Radium treatments were begun by Dr. Simpson, with the eye carefully protected. A recurrent proptosis was first noticed in November, 1923. This became very marked, and a mass was again palpable in the orbit at the upper inner angle.

Vision remained normal until the end of January, 1924, then began to fail quite rapidly, due to an optic neuritis with 6 D. elevation and also to a radium burn, which involved the cornea in spite of the protection. Because of the condition of the eye, it seemed best to enucleate it and remove the tumor mass, which was done. The mass was found to be encapsulated and lying near the bony wall at the upper inner angle, and extending back to the optic nerve foramen, but did not seem to involve it.

The report from the Post Graduate Hospital Laboratory at this time called the mass a gliomatous carcinoma. The boy was put on radium treatments and up to date had had thirty-six hours of radium exposure, with no sign of recurrence of the growth.

Ophthalmoplegia Interna and Externa.

DR. A. H. PEMBER showed a case on the service of Dr. Suker at Cook County Hospital, which had been seen by the Society three months previously as a case of ophthalmoplegia due to basilar luetic meningitis. At that time the vision was 20/200 in each eye, pupils were irregular and unequal, and reacted only to sympathetic stimulation, and in the left eye all extrinsic muscles were paralyzed excepting the superior oblique. The patient was color blind, and there was marked ptosis. Wassermann 2 plus. Visual fields revealed absence of vision on nasal half of left retina; fundi showed bilateral optic atrophy with peripheral luetic chorioretinitis. Under intensive antiluetic treatment he had improved generally, and the vision had come up to R. E.=20/30, L. E.=20/70, with a gain in weight of twenty-five pounds,

his chief complaint at this time being diplopia. Maddox rod showed 14° insufficiency of left external rectus, and 20° of left superior rectus. The previous fundus findings had so changed in character that the retina and macular areas appeared almost normal. Both discs were still atrophic.

Fig. 1.—Frontal radiogram Chapman's case of osteoma of anterior clinoid process.

Solitary Tubercle of Choroid.

Dr. George F. Suker presented a nurse of the Cook County Hospital with a healed solitary tubercle in the lower quadrant of the left choroid. When first seen, it was an elevated grayish mass, with sparse vascularization and no pigment. The mass was definitely circumscribed, elevating the retina over it. The apex of the mass could best be seen with a plus 10 and its periphery with the aperture. The vision was materially reduced and a large superior absolute scotoma was present. The tuberculin reactions were practically negative, so were all serologic examinations. No possible focal infection could be ascertained. Under rather numerous intravenous injections of soluble sodium iodid the tubercle subsided, leaving a large area of atrophic choroid with heavily pigmented periphery and no elevation in any section of the area. The overlying retina was also atrophic.

Discussion. Dr. William E. Gamble said he had had a case of tuberculosis of the optic nerve in which he used 1½ mg. of old tuberculin with slight focal reaction, then 3 mg., with a marked reduction in sight. The sight returned in the course of forty-eight hours. It was his opinion that in cases of tuberculosis of the optic nerve and of the choroid, if a proper method was used a reaction in sight reduction would be gained.

Dr. Robert Von Der Heydt stated that he had a case at present under treatment which had a lesion in the choroid separate from the nervehead. This showed pigment as well as fresh involvement. He had proof of the fresh involvement not merely by ophthalmoscopic observation, but by the presence of an active definite leucocytosis in the anterior chamber. In view of the number of similar cases he had seen with this condition, he believed it a definite point in the diagnosis of present or recent inflammatory activity of the uveal tract.

Dr. Harry Gradle asked if cellular elements were found in the retrolental space and vitreous.

Dr. Von Der Heydt said that leucocytes could be seen scattered thruout the vitreous. No doubt they were pres-

ent in the retrolental space, but not in sufficient numbers to demonstrate a circulation of fluid. When seen in the vitreous they were slightly larger than in the aqueous, because of the added magnification of the lens.

tor said recovery was complete. Was in a nervous, irritable condition, with pain and looseness of bowels two years ago. Tonsils were removed at that time, and she was in bed at the hospital for about two weeks following, on ac-

Fig. 2.—Lateral radiogram of Chapman's case of osteoma of anterior clinoid process.

Anomalous Loop of Retinal Vein.

DR. J. P. FITZGERALD presented a case.

Optic Atrophy of Left Eye, Probable Osteoma of Left Anterior Clinoid Process.

DR. VERNON A. CHAPMAN, (Milwaukee) presented G. M., eleven years of age. He first saw her two years ago, when she came to him with divergence of the left eye, particularly when she was tired. The eyes had never been sore or inflamed. Right pupil reacted well to light; left, very little reaction to light, but reacted well consensually to light. Divergence had first been noticed about eighteen months previously. Vision, R. E.=5/5; L. E.=light perception in lower and lower temporal field. Marked optic atrophy of left eye. Wassermann negative. X-ray examination of nasal accessory sinuses was advised, but was not then carried out.

History showed that she had had measles when three years of age, was rather slow in recovering, but the doc-

count of a temperature which would rise to 102 degrees every afternoon. The physician could not determine what caused this rise in temperature. No history of other illness. She had gained in weight since the tonsillectomy, and so far as the mother knew she had never had any accident or blow on the head.

Maternal grandmother developed eye trouble when eighteen years of age, for which glasses had been of no service. Eyes always weak. Had hemorrhages when about 32 years old. Later cataracts developed, and one "dropped into the eyeball" (probably the vitreous) and the eyeball was removed two years later. Died six or eight years later of cancer of intestines.

The child was again brought to Dr. Chapman in September, 1923. For several summers she had sneezing attacks and thin mucous discharge from nose, and some obstruction to breathing, which would last from a week to ten days, mostly in the summer, but occasionally in the winter. No difference

had been noticed in her eyes. With the nasal attacks she had looseness of the bowels.

Vision at this time was found to be 6/6 minus 1 in the R. E., and light perception and movements in lower field only in the L. E. The ophthalmoscopic findings were similar to those recorded two years previously; right fundus more congested, especially in the upper nasal field. Large posterior, raspberry hypertrophy of right lower turbinate and lesser one of left. Suspected adenoid tissue in vault of nasopharynx. Intumescence of nasal, nasopharyngeal and bronchial mucous membrane. Some wheezing in bronchioles.

X-ray examination of the sinuses showed the frontal sinuses to be well developed, average size and of normal density. Ethmoid areas appeared clear, antra average size, with normal and equal density. The lateral plate showed sphenoid absolutely dense, no air space being seen. There was a dense oval, apparently osseous shadow, about 2x1½ cm. in size, arising from region of anterior clinoid process and left lesser wing of sphenoid bone. The P. A. plate showed the lesser wing of the sphenoid, on the left, to be about twice the size of the right, and of much greater density. Sella turcica is distorted, and appears small. Posterior clinoid processes could be seen in about the normal position. The roentgenologist's report suggested bony anomaly, or more probably osteoma of left anterior clinoid process and left lesser wing of sphenoid.

The child had been in the north woods during the summer, and had lost some weight for the first time in several years. There was no complaint of headaches or pain in the eyes. The object field of the left eye was somewhat contracted, especially the upper and lower temporal fields. This might be due to the fact that she had a rather narrow palpebral fissure, with the skin of the eyelids thickened and overhanging, partly obstructing the field of vision. The left eye could not distinguish colors at all by reflected light.

In March, 1924, X-rays were taken of the optic foramina, and the right foramen was found circular, measuring 6 mm. in diameter, the left oval, measing 9x6 mm. Vision R. 6/5 minus 1; when put under atropin cycloplegia; R. 6/5 minus 1 or 2. No glasses were prescribed, and no treatment advised, but the child was being kept under fairly close observation.

CLARENCE LOEB,
Corresponding Secretary.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

JULY, 1924.

Retinal Disturbance of Vascular Origin.

DR. E. C. ELLETT reported three cases: Case 1. J. B., aged 60, seen March, 1923, for failing vision O. D. of a few hours duration. Vision 20/40 with glasses. The retinal arteries were of the copper wire type, veins a little full and tortuous. There were many retinal hemorrhages in and above the macula, rounded and irregular, with white patches in the center of some. He was under treatment for nephritis and high blood pressure. O. S. normal. In December, 1923, both eyes showed veiled nerve edges, radiating flame shaped hemorrhages and round "puff balls" of exudate. Vision was only slightly affected. Jan. 18th, 1924, there were a few fresh hemorrhages and retinal edema. Feb. 8th he died. The last urinalysis was Sp. Gr. 1006, albumin ++, a little pus and a few hyalin casts. Blood urea 66, blood pressure 200/110.

In this case the vascular changes predominated, the lesions suggestive of renal disease, i.e. the fluffy exudate, not appearing until late in the history of the case. Diagnosis malignant hypertension.

Case 2. J. B., aged 20. Seen April 3, 1924. Had been in bed five months with "kidney trouble". Vision blurred 5 or 6 days. Vn. O.D. 20/100, O.S. 20/200. Both eyes showed soft patches of retinal exudate, mostly in macula region, a few hemorrhages, veins a little swollen and surrounded by edematous retina. July 1st the patient died.

This is the type in which retinitis predominates. The prognosis is bad for life.

Case 3. Mrs. D., age 60. Under observation 13 years for refractive error, presbyopia, retinal arteriosclerosis and incipient cataract. In November, 1923 the vision failed in O.S. She had headaches and pain in the back of the neck. The right eye had normal vision, but the veins were beaded, retina slightly edematous and arteries sclerosed. The left eye showed the same, with a preretinal hemorrhage down and in. Vn. 20/80. A week later there was a large vitreous hemorrhage in O.S. and vision 4/200. This cleared and the vision became normal in four weeks. Jan. 30, 1924 a few vitreous floaters and arteriosclerosis. Blood pressure 235/110. Is on a diet, etc., for nephritis and high blood presure. As far as the eyes go this is the retinitis of hypertension with little to suggest renal disease. There is cardiac hypertrophy but no murmur, a few hyalin and granular casts, with phenolphthalein output of 60% in two hours. Diagnosis, arteriosclerosis and benign hypertension.

Vitreous Prolapse after Cataract Extraction.

Dr. E. C. Ellett reported the case. The lens was not removed in capsule, but the pupil is free of membrane and cortical remains. A large bead of vitreous, visible on account of being slightly blood stained, can be see lying in the anterior chamber, overlying the iris for a small distance beyond the edge of the pupil. Vision 20/25 with correction.

HOUSTON OPHTHALMOLOGICAL AND OTO-LARYNGOLOGICAL SOCIETY.

July 1st, 1924.

Ocular Paralysis.

Dr. E. L. Goar presented a young woman with a paralysis of divergence. He saw her first on May first when, following an attack of furunculosis of the ear, she developed a diplopia for distance; it was homonymous, and showed fourteen degrees of esophoria. A week later the esophoria was thirty degrees, and orthophoria at ten inches; the field of double images plotted was the same in all directions. He had not seen her for six weeks, all of which time she had the right eye blocked, to exclude double images. The patient's right eye turned in and she was fixing with the left eye.

Discussion. Dr. Slataper thought this a case of muscle paresis, and his first thought would be of syphilis.

Dr. R. Daily also thought that this is a case of paresis of the external rectus, but it needn't be from syphilis, because these paresis occur following infections. She had seen one recently following ptomain poisoning.

Optic Neuritis.

Dr. R. Daily presented a man, 35 years of age, with a unilateral optic neuritis, a large central scotoma for white, and marked contraction of the visual field; hemorrhages over the disc, with distension of the veins, and edema of retina. Physical examination, urine and Wassermann were negative. Dr. L. Daily reported a hyperplastic ethmoiditis on that side, and did a resection of the septum, and opened the posterior ethmoid and sphenoid cells; ten days later without any changes in the fundus vision was improved, and the scotoma cleared up.

Discussion. Dr. Lapat mentioned a case of optic neuritis, which cleared up completely in ten days on potassium iodid. If the sinuses had been opened in this case, one would have attributed the improvement to that.

The program of the evening was a report of the eye section proceedings of the A. M. A. by Dr. Goar, who gave a concise review of all the papers read, bringing out the salient points of each paper. He made a plea for a better support of the American Journal of Ophthalmology by the ophthalmologists.

Ray K. Daily, Secretary.

OPHTHALMIC INSTRUMENTS OF SCIENTIFIC PRECISION.

This Section of the AMERICAN JOURNAL OF OPHTHALMOLOGY is intended primarily to present to the Ophthalmic Public the mechanics and use of the modern accepted instruments of precision. These are to be described and illustrated from a purely impersonal standpoint without clinical claims and apart from all commercial taint. It is the hope of the Editor that any reader who has had especial experience with any particular instrument will offer the benefit of his knowledge. However, the Editor reserves the right to wield a healthy blue pencil in order that the contributions may conform to the aims.

H. S. G.

THE EXOPHTHALMOMETER.

CONRAD BERENS, M. D.,

NEW YORK CITY.

The need for precise instruments to measure the amount of exophthalmos in some cases has been realized since 1865, when Cohn (Cohn, Hermann, Vgl. 43. Jahresbricht der schles. Gesellsch. für vaterl. Cultur 1865, p. 156.) demonstrated the Ophthalmoprostatometer. He (Cohn, Hermann, Messungen der Augen mittelst eines neuen Instrumentes, des Exophthalmometers. Klin. Monatsbl. für Augenheilkunde 1867, V. G. 339) demonstrated his improved model before the International Congress on Ophthalmology in Paris in 1867 and called it the "Exophthalmometer."

Since Cohn's instrument numerous exophthalmometers have been constructed, but most are cumbersome and complicated like Cohn's instrument—for example, the Helmholtz model. The Javal ophthalmometer may be used as an exophthalmometer by applying a special scale, but this instrument is not portable. The instruments of Volkmann, Zehender, Birch-Hirschfeld, Kayser and Emmett are inaccurate, for the protrusion of the eye is measured from the side and it is impossible to place the instrument in exactly the same position for the examination of the other eye. Most exophthalmometers measure from either the upper or outer orbital margins and these points are not always symmetric due to the frequency of cranial asymmetry. Kiyosawa (Kiyosawa, Ophthalmology, Oct., 1914) devised an instrument like a pelvimeter. One arm is placed on the occipital protuberance and the other on the cornea. The distance between these points is measured and the comparison made. The exophthalmometer invented by Lohmann (Lohmann, W. Archiv. f. Augenheil-

Fig. 1.—Hertel's exophthalmometer.

Fig. 2.—Method of using Hertel's exophthalmometer, shown applied to patient's face.

kunde, 1913. Vol. LXXV, p. 85, Translated Archives of Ophthalmology, 1916, vol. XLV) is quite accurate. The instrument is held in position by means of a head band attached to the sagittal plane of the head, and measurements are made from the outer orbital margins to the apices of the corneae. The most popular instrument is the second model devised by Hertel, the use of which has been fully described by Schlabs (Schlabs, George, Messungen mit dem hertelschen Exophthalmometer. Inaugural Disseration, Breslau, 1915). The instrument is small enough to be portable and is easily applied. The instrument is not absolutely precise as different observers' measurements vary from 1 to 3 mm.

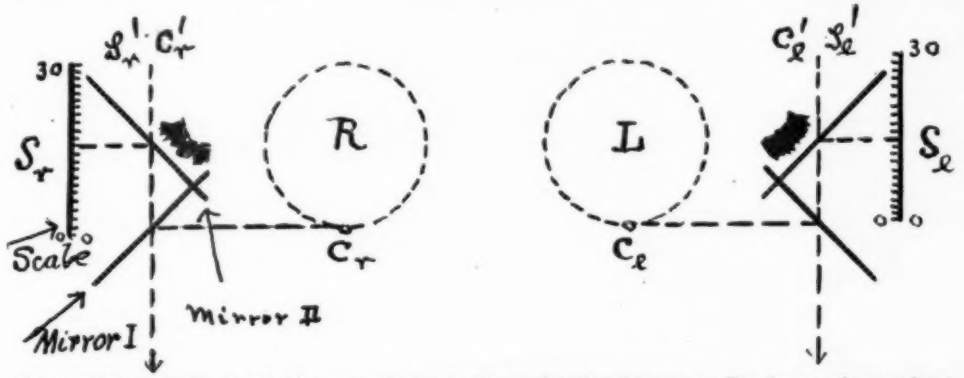

Fig. 3.—Diagrammatic sketch of course of rays in Hertel Exophthalmometer. The lower mirror reflects the eye of the patient, so that it is seen in profile. The upper mirror reflects the scale, so that it seems to be in contact with the eye of the patient.

The Hertel exophthalmometer is fitted with two movable mirrors and scale carriers with sliding sleeves, by which they may be slipped along a guide bar and accurately set to take the outer margins of the patient's orbital cavities. The distance between these margins is shown by the scale on the guide bar. For every new measurement to be taken in a given case the instrument may be quickly set by the scale on the slide bar, so this reading should always be recorded. To apply the instrument, the round end of the scale carrier should be rested firmly on the outer orbital margins. The patient is placed facing a good light and is asked to fix upon a point between the observer's eyebrows. The observer then looks with both eyes into the left or right pair of crossed mirrors. In the lower mirror, the lower half of the vertical profile of the cornea will be seen turned around into a plane at right angles to the observer's line of sight, while the upper mirror forms an image of the scale for measuring the protrusion of the cornea in approximately the same plane in which the profile of the cornea is seen; the two images are therefore to be considered coincident. In the event of the corneal apex being situated exactly 20 mm. nearer to the meridional plane than the points where the instrument rests on the orbital margins, the planes of the scale image and the corneal profile are strictly coincident. The reading gives the distance in millimeters from a frontal plane passing thru the points of contact on the orbital margins, which, unfortunately, are not fixed points.

Rollet and Durand (Revue Générale d'Ophtal., 1912, May) have modified the instrument by adding two sights on a scale, one fixed, the other sliding. Upon applying, the sights are moved to mark the tangent to the apex of the cornea and the degree of exophthalmos read off on the modified scale. From their study of 200 normal eyes, they state that the average protrusion is 12 to 14 mm.

The exophthalmometer is probably of greatest value in the study of the protrusion of the eyes in orbital tumors and Graves' disease, but it is also of value in orbital inflammations, foreign bodies in the orbit, retrobulbar hemorrhage, and in the study of the protrusion of the eyes occurring during menstruation.

THE DIFFERENTIAL PUPILLOSCOPE.

OTTO BARKAN, M. D.,
SAN FRANCISCO, CAL.

In the differential pupilloscope of C. v. Hess, we have a very exact quantitative method of estimating the minimum differences of illumination that will cause a reaction of the pupil. Fig. 1.) The patient's eye is observed thru a telescope of eight magnifications (a). Thru tube A, light is cast upon the eye. In front of this tube is a frame B, consisting of an upper and lower compartment, the upper, b, containing a series of grey glasses of known permeability to light. The lower, c, contains two grey prisms, graduated and calibrated, which can be made to slide upon one another by means of a micrometer screw (d). The prisms are most permeable to light at their apices and least at their bases, so that the permeability of the system of prisms varies according as to whether the apices, bases, or intervening portions are superimposed. Therefore by manipulating the micrometer screw we may obtain at will any desired intensity of light, or, conversely, for any given position of the prism,

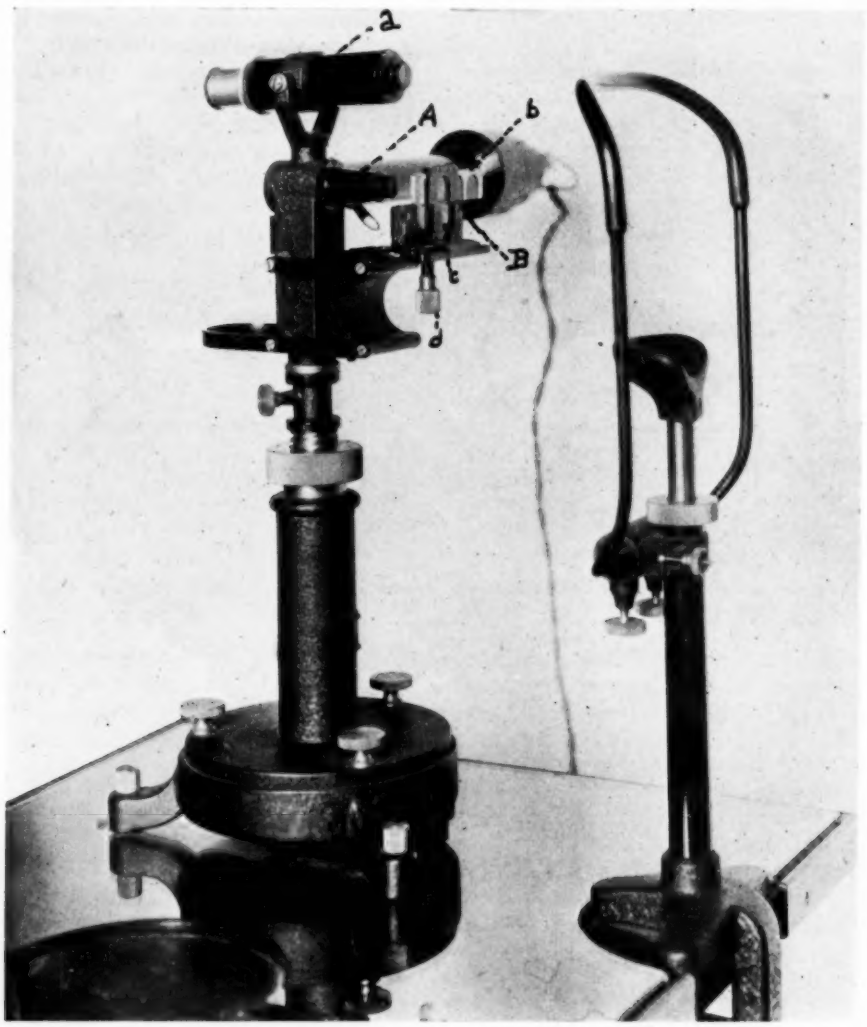

Fig. 4.—Differential pupillometer of Hess.

read off on a scale the position and therewith the amount of light passing thru. For example a position of the prisms can be found at which their permeability will equal that of one of the constant grey glasses. When this is the case, the same amount of light will strike the eye irrespective of which compartment of the frame it is traversing, and by swinging these up and down the eye will be successively illuminated with lights of equal intensity. Consequently the pupil remains immobile since successive illumination with lights of equal intensity is the same as illumination with one constant light.

In practice, to obtain objective results, we first proceed with differences of light sufficient to excite a marked reaction and then gradually diminish the light differences, by varying the positions of the prisms, until the least difference of successive light intensities is found which just suffices to elicit a pupillary reaction. In this manner is measured MOTOR DISCRIMINATIVE SENSIBILITY, (M. D. S.). Physiologically, this is the case when the difference of light intensities is as 95 to 100, or in other words, the smallest differences of light intensities between which the normal pupil can discriminate is as 95 to 100. This value is constant, is irrespective of the age of the individual, and is independent of the state of adaptation.

In practice the M. D. S. is not numerically designated by the actual differences of light, but by a quotient (Q), which is obtained from it by a simple process of arithmetic. Physiologically Q=0.9. The lowest limit of the physiologic is 0.84. Diminution of Q to 0.84 is definitely pathologic. A pupillary lesion of such small degree is not detectible by any other method. In fact, one may see cases in which Q is reduced to 0.6 and yet excellent clinical observers, using the usual methods, are unable to detect any pathologic change in the reaction.

By proceeding similarly to the above also can be determined the VISUAL DISCRIMINATIVE SENSIBILITY (V. D. S.). This is done by the subject stating which of the successive lights is the brighter. Under normal conditions, the V. D. S. is found to equal exactly the M. D. S. That is, the smaller difference of light intensity between which the pupil can discriminate, can also still be discriminated visually by the patient and vice versa.

A very valuable diagnostic aid for differentiating between a lesion of the sensory portion (receptor or fiber lesion), and a lesion in other parts of the reflex is obtained by comparing the direct with the consensual reaction. The differential pupilloscope is of particular value for the early diagnosis of tabes. An Argyll Robertson pupil can be definitely diagnosed at a time when to our present method the pupillary reaction appears quite normal. Moreover, the diagnosis of such a pupillary lesion can be made irrespective of coincident optic atrophy, opacities of the media or even of synechiae, so long as in the latter case a portion of the pupil is not mechanically impeded in its freedom of movement.

As there exists a physiologic standard for the reactivity of the pupil which is independent of the age of the individual, and as the reactivity of the pupil can be measured with mathematical accuracy and be numerically expressed, one can in any given case such as anisocoria, deformed pupils, etc., determine with certitude whether the anomaly in question is pathologic or not. If the former is the case, the lesion can in most cases be localized as well. It is also of aid in the early diagnosis of optic atrophy.

The method is a very useful adjunct for the detection of simulation or aggravation. In some of these cases, it proves to be a decisive diagnostic factor.

Since the reactivity of the pupil is not affected by opacities of the media, the method retains its full diagnostic value in the presence of cataract, opacities of the vitreous, etc. It may in some cases contraindicate cataract, operation or indicate the giving of a very guarded operative prognosis.

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CORRECTION OF ANISOMETROPIA.

Every lens is a double series of prisms, increasing each way from 0 at the optic center to a maximum at the edge. The prism strength at any point is determined by the curvature, or strength of the lens, and the distance of the point from the optic center. This is true for a spheric lens in all directions, and for a cylindric lens at right angles to the axis. If the eye looks thru any part of the lens, other than the optic center, it looks thru a prism of a strength so determined. If it looks thru a 10 D. lens at a point 10 mm. from the optic center of the lens, it looks in effect thru a 10 centrad prism; a prism with a refracting angle of about 10 degrees.

If the lenses before the two eyes are equal and their optic centers properly placed, such prismatic effects are equal for the two eyes and in the same direction; so the variation of prismatic effect by looking thru different parts of the lenses causes no inconvenience, or strain. The binocular coordination of the eye movements is not disturbed.

But when the strength of the lenses before the two eyes differs, the same divergence of the visual axes from the optic centers produces unequal prismatic effects; and the binocular coordination of movements is disturbed. Thus, if the part of each lens looked thru is 10 mm. from the optic center, and one lens has a strength of 10 D., while the other has a strength of only 5 D., the prismatic effect before one eye will be 10 centrads and before the other eye only 5 centrads; causing corresponding disturbance of binocular coordination.

The range of lateral binocular coordination is wide; the amount of convergence can vary, normally, from 20 or 30 degrees positive to 4 or 5 degrees negative. A moderate demand on this variability may be met without discomfort. Five centrads in the horizontal direction can be overcome and may cause no discomfort. But such a difference in a vertical direction cannot be overcome, by many persons, and will cause diplopia. A person with such glasses before his eyes cannot look thru the upper or lower part of them without seeing double. It is this effect that sharply limits the amount of difference between the strength of the two glasses, that can be used with comfort in anisometropia.

Patients vary greatly, in the amount of prismatic difference that they can overcome, and their willingness to put up with the necessary discomfort of learning to overcome it. In general a difference of two diopters in the strength of the lenses before the two eyes can be tolerated, and in time the glasses become comfortable. The adjustment to them consists, partly in learning to overcome slightly greater prismatic effects, and largely in learning to not look near the edge of the lens. Probably it also includes development of the ability to interpret rightly, and to use for binocular vision, images received on points of the two retinas not strictly identical. The extent of this last factor in "getting used to the glasses" is worth investigating.

A few persons cannot get accustomed to the prismatic action of lenses that differ 2 D. in strength; but most people will become accustomed to such a difference and wear the glasses with comfort. Some are able to use lenses that differ more than this. But the writer has seen no patient who used his eyes freely and comfortably with lenses that differed more than 4 D. in strength. Occasionally patients have come who have struggled to use such lenses for months or years, but in the end had to give it up. Of course if the vision in one eye is very poor, so that its retinal images are easily ignored, the use of such lenses becomes possible, by giving up for the time binocular vision.

To meet the necessities of the case we have the established custom of giving for high anisometropia an accurate correction of the better eye; and for the other a lens that will go as far toward a correction as is practicable, without making the inequality of the prismatic effects too great. For patients who have corrected vision about equally good in the two eyes, it may be practical to correct the more hyperopic or less myopic eye for distant vision and the other for near work; an arrangement that gives great satisfaction to anisometropes who are also presbyopic.

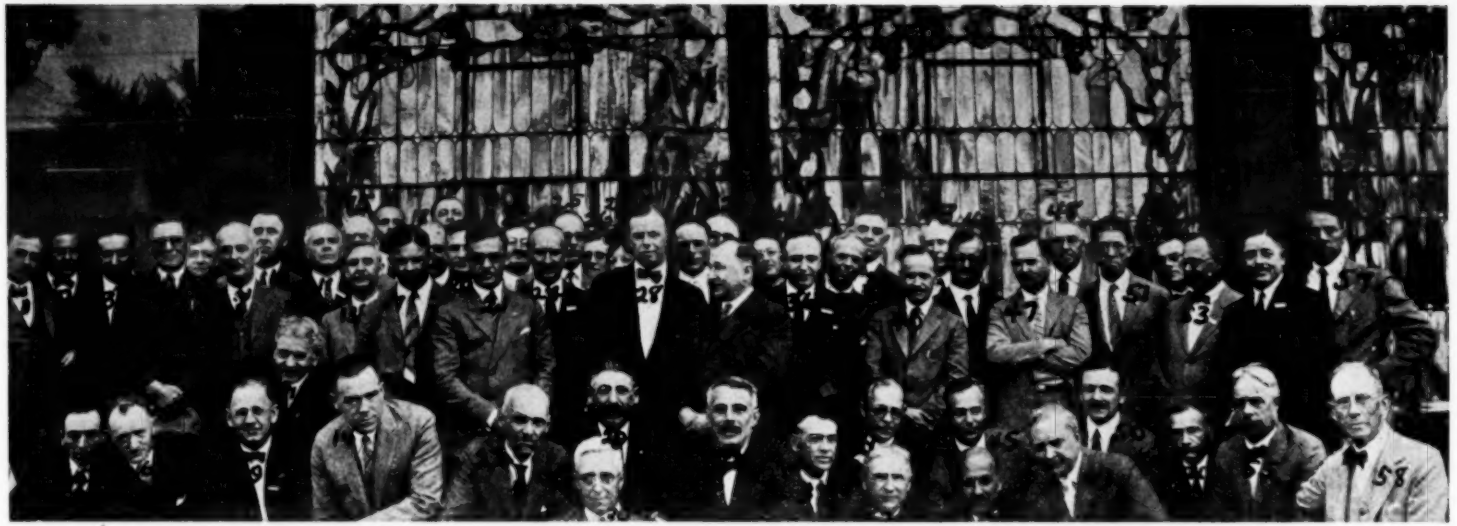
E. J.

MEETINGS FOR GRADUATE STUDY.

In July of this year there was carried thru in Denver two weeks of graduate study of Ophthalmology and Oto-Laryngology that demonstrated some things of general interest. Its plan was in the main the same as had been followed the year before; showing some improvements contributed by experience and a more complete organization. The class was larger, see p. 810. Those who participated in it received the three essential benefits of graduate study—information, interpretation and inspiration; and it demonstrated how these benefits are easily within the reach of all practitioners of these special branches of medicine.

Let us clearly distinguish between two different things that have been called graduate, or postgraduate study. The course leading to the degree of M. D., in America, gives certain fundamental scientific training basic to medicine, and a general survey of medical art that may help the young graduate to orient himself. But it does not really train him for practice and send him out competent, in any special branch of medicine. If he is to become a really creditable member of his profession he must seek further education in the line of work he proposes to follow. This preparation for special practice has been called graduate study; but it is essentially similar to the kind of study one does in college, after he "graduates" from the high school, or in the professional school, after he graduates from the college.

There is another kind of "graduate study" that has to be done by every member of a profession who hopes to obtain, or deserve the full confidence of his professional colleagues or a community. It is to continue his mental and professional development. It is needed first to remedy defects inherent in the educational scheme of former years, and to secure a knowledge of the advances that are being made from year to year in the field of scientific medicine. One who has practiced ophthalmology for forty years knows, that a very important part of



GRADUATE COURSE IN OPHTHALMOLOGY AND OTO-LARYNGOLOGY.
DENVER, COLORADO - July 21 to 31, 1924.

1 H.L. Baum
2 I.M. Lupton
3 Lewis Fisher
4 H.L. Scales
5 C.E. Cooper
6 W.E. Camp
7 Geo. Ainslie
8 H.J. Prentiss
9 Lee W. Smith
10 G.L. Boyden
11 M.L. Marlin
12 D.A. Strickler
13 F.L. Beck
14 R.B. Karkeet
15 G.L. King
16 T.W. Weaver
17 C.M. Brown
18 E.B. Swerdfeger
19 O.R. O'Neill
20 L.B. Spake
21 C.E. Savery
22 Edw. Jackson
23 R.R. Hampton
24 F.A. Davis
25 A.E. Eubank
26 L.W. Oaks
27 Bertha McDavitt
28 J.G. McLaurin
29 Robert Levy
30 W.H. Crisp
31 L.A. Latimer
32 C.S. Trimble
33 T.W. Moore
34 Marcus Feingold
35 C.T. Ralls
36 F.P. Schuster
37 W.D. Hicks
38 J.W. Tottenham
39 D.W. Henderson
40 H.L. Hickey
41 O.H. Peterson
42 T.E. Carmody
43 R. Wightman
44 Chas. D. Dixon
45 E.J. Bribach
46 Isaac H. Jones
47 T.G. Wails
48 E.M. Palmer
49 H.P. Mosher
50 C.H. Darrow
51 C.A. Thomas
52 E.V. Blak
53 W.C. Greening
54 W.G. Thigpen
55 R.E. Leatherock
56 A. Butler
57 H.L. Whitaker
58 W.C. Bane.
59
60

his present professional equipment was not possessed by any ophthalmologist at the beginning of that period. This kind of graduate study, which keeps the ophthalmic physician and surgeon growing and up to date, must be provided for, just as certainly as an office to work in, or instruments to work with.

In a way this kind of graduate study has always been carried on, thru medical societies, journals and books. But it can be made far more effective and attractive by using the best modern means of teaching and illustrating new ideas or procedures. Diagrams, photographs, lantern slides, moving pictures, models, microscopic and gross specimens, cadavers, animals' eyes, demonstrations to small groups, actual use of new instruments, the examination of clinical cases and round table conferences, were all available in the Denver Course. Such opportunities are possible wherever ophthalmologists appreciate their value, and will give the time and effort necessary to accomplish things that are most worth while. Already they are being considered for two or three other American Medical Centers, and similar methods are being tried in other fields of medicine.

To be most serviceable to members of the profession who have already been trained more or less for special practice and are already engaged in it, certain conditions must be observed. The members of such classes are busy men at home, they leave a circle of patients, sometimes rather inadequately served during their absence, and can be away a rather brief time. The instruction they get should be of the best and should be given with the greatest economy of time. At Denver, Doctors de Schweinitz, Duane, Feingold and Woodruff, with teachers of oto-laryngology equally eminent, and local teachers who have had ten years of experience in graduate teaching, were able to give this kind of instruction.

Ophthalmology and Oto-Laryngology are two distinct specialties with little more in common with each other than with other branches of medicine. But there are two very important advantages in giving them together in such a course. Most of the students are practicing and interested in both specialties, and the combined course gives a wider range of subjects and interest. In the second place such a combination makes it possible to secure a large number of good teachers, both local and those secured from a distance. The large teaching staff is necessary, to fill the students' time every day to the best advantage. Even in a large city, where two or more medical schools may be located, the best results will be obtained only by uniting all the good teachers, from all the schools and teaching hospitals. To secure the best teachers from a distance rather large classes must be provided. To give students the best use of their time these large classes must be split up a part of the day into small sections and for each section must be provided a competent instructor.

In a two weeks' course it is possible to cover wide fields of ophthalmology and oto-laryngology. Special topics must be selected that can be presented in such a time, with their closely related facts, methods, problems and recent development. At Denver, this year the chief central topics in ophthalmology were, fields of vision and their significance, culminating in the lectures of Dr. de Schweinitz and Dr. Feingold; and the ocular movements and muscle operations, culminating in the lectures of Dr. Duane and Dr. Woodruff. Such topics can be varied from year to year; but certain others should probably be offered every year, such as the normal and pathologic histology of the eye, in which the earlier training of most ophthalmologists has been deficient.

Finally, it should be emphasized that such meetings may be conducted by organizations of those working in these specialties. The one at Denver was managed by a joint committee of the Colorado Ophthalmological and Oto-Laryngological Societies. It is not essential to have the support of a university with its plant and organization, altho the advantages of such facilities should be utilized wherever possible. Managed in this way such

meetings do not need to wait until academic inertia can be overcome; and they are most likely to respond closely to the conscious needs of our special branch of the profession. At the meeting at Montreal last month, the value of graduate study managed by the profession was strikingly illustrated. Success is closely associated with the mutual character of the movement. Out of their assigned hours, the teachers at Denver were most interested and diligent students.

E. J.

THE LONDON MEETING.

At a dinner given to Professor George E. de Schweinitz at the University Club in Denver, July 29th, the guest of the evening spoke to the students and instructors taking part in the Denver Course in Ophthalmology and Oto-Laryngology, of the Convention of English speaking Ophthalmologic Societies to be held in London next year. The gathering must be regarded as of especial interest to all American ophthalmologists. At the Glasgow meeting of the British Society he had promised the hearty cooperation of his American colleagues, and he hoped they would redeem the promise with characteristic enthusiasm. It would be a rare opportunity to see English ophthalmologists and ophthalmic institutions under most favorable conditions.

The following outline has been arranged:

Monday, July 13. Opening Evening, Reception at the Royal College of Surgeons, Lincoln's Inn Fields, by the President and Council of the College.

Tuesday, July 14. Morning, Reception of delegates; Address by the President; Scientific papers. Afternoon: Visits to various institutions of ophthalmic interest. Evening: Reception.

Wednesday, July 15. Morning: Scientific papers. Afternoon: Garden Party at Aubrey House, Campden Hill. Evening: Symposium by selected speakers on "The Evolution of Binocular Vision."

Thursday, July 16. Morning: Scientific Papers. Afternoon: General meeting of the Convention to discuss the future of International Ophthalmological Congresses. At 5 p. m. The Bowman Lecture, to be delivered by Sir John Parsons, F.R.S. Evening: Banquet.

Friday, July 17. Morning: Discussion on "Microscopy of the Living Eye." Afternoon: Scientific Papers. Evening: Reception by the President at the Wellcome Historical Medical Museum.

Saturday, July 18. Excursion to Oxford and Cambridge.

There will be a Museum of Anatomical, Pathological and other exhibits. Also a Business Exhibition. Local committees are being formed to assist over-sea members, desirous of visiting various parts of the British Isles.

The registration fee for those who are not members of the Ophthalmological Society of the United Kingdom will be two pounds, and for ladies, accompanying members of the Convention, who wish to become Associate Members, 10 shillings.

BOOK NOTICES.

The Medical Department of the United States Army in the World War. Vol. XI, Surgery, Part two. Prepared under the direction of Major General M. W. Ireland. Buckram, 828 pages, illustrated in the text and by colored plates. Washington, Government Printing Office, 1924.

The contents of this volume will be of especial interest to our readers. Altho the first part is devoted to empyema, the remainder contains reports on: Maxillo-facial Surgery, by Lt. Col. Robert H. Ivy and Major Joseph D. Eby; Ophthalmology in the United States, by Brig. Gen. George E. de Schweinitz; Ophthalmology in the American Expeditionary Forces, by Col. Allen Greenwood; Oto-Laryngology in the United States, by Lt. Col. S. J. Morris; and Oto-Laryngology in the American Expeditionary Forces, by Col. James F. McKernon.

There is much in the section on Maxillo-facial Surgery that bears upon

plastic surgery of the lids and orbit. But this notice must be confined to the 173 pages and 16 plates in colors, that treat of ophthalmology as it was studied and illustrated in the army of the United States, both in America and Europe. These pages, each containing about as much as a page of this journal, present a condensed history of unique clinical experiences; which we may hope will not soon, if ever, be repeated. The report on our activities in the United States is based on records of 44 general and 39 camp base hospitals, 3 embarkation and 5 debarkation hospitals and 1 camp infirmary —a grand total of 109,604 cases. No similar statistics are given of the activities in Europe, since many of the same cases were treated in both services.

Under army regulations, the very large number of intelligent, active workers, whose observations made these reports possible, remain unnamed. But their work for the service of country, humanity and ophthalmic science has achieved success. However, credit can be given for some of the more important of the contributions thru the bibliographies, which appear in the account of the service in America. One-third of all the references contained therein are to this Journal; about half to special reports filed in Washington and a few to general medical and neurologic journals and transactions.

The fact that readers have already been put in touch with the most important contributions of the World War to ophthalmic science, excuses the brief notice of some important topics discussed in this volume. The care of the blind rose to importance during the war. There is a tabulated report of the history and condition of one hundred and seventeen cases admitted to the United States General Hospital No. 7, at Baltimore, which was especially organized to care for the blind. This table contains a great mass of information that will compare favorably with reports that have appeared in Europe, with reference to this class of cases. Ophthalmic symptoms of injury to the cervical sympathetic nerve are summarized for eleven cases. Concussion and contusion injuries, so important a feature in the reports made for other nations, furnish the subject for seven colored plates, thirteen eyes. The ocular phenomena in psychoneuroses and visual defects caused by occipital lobe lesions are subjects of detailed and very important observations. It must not be supposed that blepharoplasty and ocular prothesis has been left to the part on maxillo-facial surgery. In this account of ophthalmology in the United States there are ninety-three reproductions of photographs of cases, and numerous diagrams showing steps in technic, with good explanations.

In the account of ophthalmology in the American Expeditionary Forces, Dr. Greenwood has included allusion to what was learned by American ophthalmologists who worked in the British and French medical services, before the United States entered the war. Some things thus learned contributed much to the prompt organization and efficiency of the American service. A rather full account is given of the plans on which this service was organized. The colored plates in this portion also deal with war injuries. Two showing effects of exposure to mustard gas are especially noteworthy.

Here, too, we have notes on cases of total and partial blindness to the number of ninety-three. Of them, fifty-nine were totally blind, the others having some vision and a few fair vision in one eye. The care of the blind and the ophthalmic disturbances due to war gases receive special notice.

The volume is well printed and well bound. It will always be desirable in any medical library. Perhaps most ophthalmologists will depend on some general, medical library to furnish a copy when they wish to consult it. But it is a book well worth having and on the last page we note this announcement: "Additional copies of this publication may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at $3.50 per copy."

E. J.

Manual of the Diseases of the Eye for Students and General Practitioners. By **Charles H. May,** Director and Visiting Surgeon, Eye Service, Bellevue Hospital, New York. Eleventh edition, revised. Cloth, 451 pages, 374 illustrations including 23 plates with 73 colored figures. New York, William Wood and Co.

This book has been translated and published in seven foreign languages, and five editions have been published in London. In all more than 150,000 copies have been published. It is so widely and favorably known that little need be said of it in this notice. Chapter 11 on uveitis, and Chapter 25 on disturbances of motility of the eye have been rewritten, but not radically changed. One new colored plate has been added, representing a very light fundus and one of the negro. These are very well done. The colored plates have always been a most important feature of this book, and along with its condensed, clear text and very moderate price, have helped it to secure such wide, popular favor. E. J.

"The Tonsils." Faucial, Lingual, and Pharyngeal with some account of the posterior and lateral pharyngeal nodules. By **Harry A. Barnes, M. D.,** Instructor in Laryngology, Harvard Medical School; Laryngologist, Massachusetts Charitable Eye and Ear Infirmary. Second edition, Cloth, 212 pp, 45 illustrations, C. V. Mosby Company, St. Louis, 1923. (See also p. 558.)

This text deals with the tonsil subject in a thoro, systematic and orderly manner. The anatomy and histology of the tonsils is taken up in detail. Diseases of the tonsils and indications for operation are discussed in a conservative manner.

The different operative procedures for accomplishing tonsillectomy are described and the author's method illustrated. The radical treatment for peritonsillar abscess is considered from both theoretic and practical standpoints and the author favors it.

This text is an excellent one for the beginner in laryngology, as it contains much basic information. In it, too, will be found many practical points in diagnosis and treatment which have been evolved by Dr. Barnes during his years of practical experience.

JOHN H. HARTER.

CORRESPONDENCE.

Applications of a Mathematic Formula, Corrections.

To the Editor: I have just received the August issue of the JOURNAL and have noted several very minor errors in my article on "Applications of a Mathematical Formula," pp. 597-602. If it is not too late I wish the following corrections made in the reprints and possibly a note on this matter in the October issue. The article was a hard one to set, to proof read, and to make the suggested changes, and I wish to congratulate you all on its splendid appearance: The changes are:

1. Page 600, first column, seven lines from bottom in equation (1) make a change — to +, to read $D=D_1+D_2$.

2. In legend under Fig. 3, p. 601, make a $f\frac{100}{(cms)}$ as follows $\frac{100}{a\ f\ (cms.)}$ = etc.

3. Page 601, second column, third line, make D_n into D_N (as in equation 5 on page 600).

4. In table 2 on page 602, in the third column from the right, last line of the table, make 22.91 read 22.19, so that the last four numerical quantities in last line of table will read, 20.51, 22.19, 22.91, 23.90.

5. There should be on page 598 in table 1, at bottom of second column, a single star after the quantity ±0.02 (i. e. 0.02*), and the star should be removed from +2 and −2 (either single or double star should be removed). Then in the footnote delete the double star before the second paragraph so as to read: "The sign — gives," etc.

As you will note, these changes are minor. But, as most ophthalmologists have trouble with mathematical expressions, I have thought these small errors which would not disturb one familiar with mathematics, may cause trouble. Again thanking you for the splendid appearance of the article and asking your kindness in the foregoing.

CHARLES SHEARD, Rochester, Minn.

ABSTRACT DEPARTMENT

Reprints and journal articles to be abstracted should be sent to Dr. Lawrence T. Post, 520 Metropolitan Building, St. Louis, Mo. Only important papers will be used in this department, others of interest will be noticed in the Ophthalmic Year Book.

Liebermann, L. The Radiographic Localization of Foreign Bodies in the Eye. Brit. Jour. Ophth. 1924, v. 8, p. 109.

For accuracy in using the Sweet method, three things are necessary; an apparatus of high power, X-ray tubes suitable for such high current and very sensitive plates. To compensate for the lack of any of these requirements, Liebermann has devised as an adjuvant, the use of two 2 mm. metal plates as markers. The plates are nonmagnetic and have two holes drilled in each. A suture is first placed in position in the episcleral tissue and tied. The plates are threaded and the suture again tied over the plate. The picture is then taken after which the last knot is cut and the plate removed. The sutures remain attached to the conjunctiva by the lower knot to serve as a guide during the operation. Since the localizaton of the marked knots is exactly known, we can easily see if the optical fixation of the center of the cornea has been maintained during the exposure. At the time the author made this contribution, he was not aware that Pischel had described, ten days previous, a similar method, using, however, 3 mm. metal needles. The author believes that his method has distinct advantages in that the sutures can remain anchored and do not interfere in any way with the operation in the removal of nonmagnetic bodies.

D. F. H.

James, R. R. Lupus of the Lacrimal Sac. Brit. Jour. Ophth., Apr. 1924, v. 8, No. 4, p. 165.

The reporter observed a female, aged 26 years, with a left lacrimal abscess with a fistulous opening, the right regurgitant. The nose was slightly swollen and bulbous, Wassermann negative. Both fomentations and astringents were used. Later in the year examination showed the interior of the nose completely blocked by crusts. Under treatment this was much improved. Under a general anesthesia the removal of the sac was undertaken. The knife entered a cavity filled with granulation tissue. This was scraped away together with mucous membrane. An extensive ulcer of the nares was present, a portion of which was removed and inserted into a guinea pig. The granulation tissue showed giant cells, characteristic of tuberculosis. The guinea pig when killed was found to be riddled with tuberculosis. Ten days after operation, the wound in the region of the sac was treated with electric cautery which was also passed down the nasal canal. The fistulous tract completely closed. D. F. H.

Sattler, C. H. Increase of Tobacco-Alcohol Amblyopia after the War. Klin. M. f. Augenh., 1923, v. 70, p. 318.

Among the policlinical patients at Koenigsberg, the number of intoxication amblyopias in 1922 rose to six times that before the war. Sattler examined fifty-seven patients with regard to the amount and mode of tobacco and alcohol used. While formerly the amblyopia often was caused by smoking cigars, the present intoxications were almost exclusively due to the cheaper smoking of pipes. The causes were the increased use of self-grown, simple dried, not cured tobacco, and thus especially rich in nicotin, in pipes and in chewing. The unhygienic way of smoking increased the drinking of fuel spirits with its contents of methyl alcohol. For the 24% of the amblyopias in people living in cities, a lowered resistance of the organism from undernutrition may perhaps also be considered. C. Z.

Bell, George Huston, New Method of Preventing Post-Operative Intraocular Infections. Arch. of Ophth, v. LII, No. 5, 1923.

Bell reiterates the contentions outlined in his paper of 1921, reporting 1250 cases of intraocular operations with only three secondary infections, all coming on nine days after opera-

tion. The points stressed in the author's technic are: Routine search for focal infection and treatment if necessary; a general examination including Wassermann test; castor oil 24 hours before operation; instillation of silver nitrat 1% two hours before operation and 25% argyrol at time of operation. The author strongly advocates preliminary iridectomy. He believes that with his technic, operation is safe irrespective of the organisms found in the conjunctiva, if the patient's eye looks clinically clean and, in fact, he no longer takes smears in his private practice. L. P.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. George H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph L. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. G. McD. Van Poole, Honolulu; Dr. E. B. Cayce, Nashville, Tenn.; Dr. Gaylord C. Hall, Louisville, Ky.; Dr. Edward D. LeCompte, Salt Lake City.

DEATHS.

Dr. Frederick H. Bailey, Fargo, N. D., aged 57, died July 28.

Dr. Bruce Ferguson, aged 60, died at Surbiton, England, June 10.

Dr. Cicero M. Hobby, Iowa City, Iowa, aged 75, died July 6, at San Diego, California.

Dr. J. Pondé, professor of ophthalmology at Bahia, Brazil, died recently.

SOCIETIES.

The Société française d'Ophtalmologie will hold its 38th Congress at Brussels, Belgium, May 11, 1925.

At the twelfth annual meeting of the Pacific Coast Oto-Ophthalmological Society, July 10th to 12th, at Portland, Oregon, the following officers were elected: President, Dr. Henry M. Cunningham, Vancouver, B. C.; Vice Presidents, Drs. Clarence B. Wood, Los Angeles, and Hans Barkan, San Francisco; Secretary-Treasurer, Dr. Walter F. Hoffman, Seattle. The next meeting will be held at Vancouver.

PERSONAL.

Dr. Herbert Moulton has been elected president of the Arkansas State Medical Society.

Dr. James W. Smith has been appointed assistant attending ophthalmologist to the New York City Hospital.

Dr. Luther C. Peter of Philadelphia announces the removal of his offices on September first to Suite 200, Physicians Building.

Dr. Joseph D. Heitger of Louisville has been in Vienna and Paris doing postgraduate work. He is now on his way home.

Dr. A. C. Magruder of Colorado Springs has been spending a short vacation in the Hawaiian Islands.

Dr. Howard Clarke became disassociated from "The Clinic" on September 1st and opened offices in the Young Building, Honolulu.

Dr. Rufus Hagood, of Maui, opened offices in Honolulu, September 1st, limiting his practice to eye, ear, nose and throat diseases.

Dr. John F. Fulton of St. Paul, Minnesota, has recently returned from Europe. While in England, he attended the Oxford Congress of Ophthalmology.

Dr. W. P. Hollis of Hartford City, Indiana, leaves for Vienna and postgraduate work immediately after the meeting of the American Academy of Ophthalmology and Oto-Laryngology, during September.

Dr. Harry W. Woodruff of Joliet was the guest of Dr. May in Kansas City the last of July, and conducted an operative clinic at St. Margaret's Hospital.

Dr. R. J. Curdy, of Kansas City, who suffered a fracture of the head of the femur in June, when thrown from a horse, is doing nicely and expects to resume his practice September 1st.

Dr. Robert von der Heydt of Chicago has made a recent trip to Europe. His principal visit there was to Professor Vogt of Zurich, to confer about a second edition of the latter's Slit Lamp Atlas.

Dr. Walter Parker of Detroit has accepted an invitation from the Kansas City Clinical Society and will deliver an address on cataract, at their fall clinical conference in October.

Dr. C. A. Veasey, Jr., who has recently completed his three years' term of service as house surgeon in the New York Eye and Ear Infirmary, has become associated with his father, Dr. C. A. Veasey, Sr., in Spokane, Washington.

Dr. Hendrie W. Grant, St. Paul, has been appointed assistant in ophthalmology, and Dr. Harold L. Goss, Rochester, refractionist of the University of Minnesota Medical School.

On August 13th, Dr. H. B. Young of Burlington, Iowa, was given an ovation by his confreres upon the anniversary of his fifty years of medical service.

Dr. E. E. Maxey announces his removal from Boise and Idaho to Aberdeen, Washington, where he will continue his practice, limited to the eye, ear, nose and throat.

Dr. Allen Greenwood and Miss Marion Elizabeth Tucker announce their marriage on Saturday, August the 16th, 1924. They will be at home at 38 Cypress Road, Wellesley Hills, Massachusetts.

Dr. and Mrs. C. A. Veasey, Sr., and their daughter, have recently returned from a winter cruise of the Mediterranean, including Syria, Palestine and Egypt, afterwards spending some time in Europe, visiting among other places Vienna, Paris and London.

Among changes announced in the faculty of the Indiana University School of Medicine are: Dr. William F. Hughes, now associate professor of ophthalmology, to clinical professor of ophthalmology, and Dr. George S. Row, associate in ophthalmology, to assistant professor in ophthalmology.

MISCELLANEOUS.

The New York Eye and Ear Infirmary received $25,000 by the will of Miss Emily F. Southmayd.

A bequest of $106,683 each, was left the Society for the Relief of the Destitute Blind and the New York Association for the Blind by Mrs. Sarah J. Robinson.

Trachoma will be combatted in a joint health campaign, started among the Indians of Wisconsin by the State Board of Health and the Federal Bureau of Indian Affairs.

According to official report, seamen were first tested as to acuity of vision in 1923. Of 8,267 examined, 2.94 per cent had defective vision. Of 8,086 tested for color vision, 0.30 per cent lacked perception of green, 0.89 per cent could not distinguish red, while 1.37 per cent were totally color blind or almost so.

Dr. George E. de Schweinitz, owing to age limit regulations, has retired from the chair he held in the University of Pennsylvania. But he has now been elected a Professor of Ophthalmology in the Graduate School of Medicine of the University and will give a course of illustrated lectures during the coming session. These lectures will cover:

Congenital anomalies of the orbit.
Cranial deformities (oxycephaly, etc.)
Fractures of the skull and orbital injuries.
Brain tension (ocular symptoms).
Pituitary body disease (ocular symptoms).
Thrombosis of the cavernous sinus.
Pulsating exophthalmos.
Exophthalmic goiter (ocular signs.)
Intermittent exophthalmos.
Periostitis of the orbit.
Tenonitis.
Orbital abscess and scleritis.
Tumors of the orbit.

AN ENGLISH SPEAKING OPHTHALMOLOGIC CONVENTION.

It has been decided by the Ophthalmological Society of the United Kingdom and its affiliated societies to hold in London next year a Convention of English speaking ophthalmologic societies and associations, and invitations have been issued to the presidents of all such bodies in the different parts of the British Empire and the United States of America asking them to appoint official delegates or representatives on the occasion. The date suggested is from July 14th to July 17th, inclusive, and the Convention will be inaugurated by a reception given by the President and the Council of the Royal College of Surgeons of England at the College on the evening of July 13th. The program for the four days' work has been already arranged. Each morning, two afternoons, and one evening will be occupied with the scientific work of the Convention. The Bowman Lecture will be delivered by Sir John Parsons, the chairman of the committee for scientific business and publication, there will be a discussion on the microscopy of the living eye, and selected speakers will also take part in a debate on the evolution of binocular vision. The rest of the time will be taken up by visits to various institutions of ophthalmologic interest, while receptions have been arranged, a banquet and a garden party. Those taking part in the Convention who are not members of the Ophthalmological Society will pay a fee of 2 pounds, while for ladies accompanying members of the Convention, who wish to become associate members, the fee will be 10 shillings. The President of the Convention is Mr. E. Treacher Collins, of London.

Lancet, July 19, 1924.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in **heavy-faced type.** The abbreviations mean: (Ill.) illustrated; (Pl.) plates; (Col. Pl.) colored plates. Abst. shows it is in an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper. Under repeated titles are given additional references to papers already noticed. To secure early mention, copies of papers or reprints should be sent to American Journal of Ophthalmology, 217 Imperial Building, Denver, Colorado.

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